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Ontario Geological Survey
Open File Report 6076

Wawang Lake–English River Lake Sediment Survey, Northwestern Ontario: PGE Data and Final Results/ Interpretation of Lake Sediment Geochemistry

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ONTARIO GEOLOGICAL SURVEY

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Wawang Lake–English River Lake Sediment Survey, Northwestern Ontario: PGE Data and Final Results/Interpretation of Lake Sediment Geochemistry

by

R.D. Dyer

2002

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Abstract

Fieldwork for a high density lake sediment geochemical survey of the Wawang Lake–English River area, located approximately 100 km northwest of Thunder Bay, was carried out in July 1995. A total of 450 lake sediment samples were collected and analyzed by instrumental neutron activation analysis (INAA) and total digestion (Na-fusion) inductively coupled plasma-mass spectroscopy (ICP-MS) for 60 elements. A preliminary Open File Report (OFR 5940) was published by Dyer and Breaks (1996), which described the presence of several multi-element anomalous areas. Anomalous elements included: rare-earth elements (REEs), Ba, Co, Cr, Fe, Mo, Nb, Sc, Sn, Th, U, V, Y and Zn. The present report concerns the re-analysis of samples using an aqua-regia digestion followed by inductively coupled plasma-optical emission spectroscopy (ICP-OES), ICP-MS and analysis for platinum group elements (PGEs) by fire assay (FA) ICP-MS. This report also contains the results of additional sampling carried out in 1993 and 1997, the latter concentrating primarily in those areas where significant anomalous results had been obtained and published in the 1996 report. The results of the additional sampling and re-analysis of all samples confirm and enhance the previously outlined anomalous areas. In particular, the original Be, Co, Cr, Li, Mo, Ta, Th, U, Y and REEs lake sediment anomalies have been reproduced. Data for Pb and Zr, not previously available, show anomalous levels that correlate with the 2 most significant REE multi-element anomalous areas. This geochemical signature is prospective for rare-earth element pegmatites or alkalic intrusives. In addition, the core areas of anomalies 1 and 2 have extremely anomalous iron levels (up to 46% Fe). In conjunction with strong REE, Th and U anomalies, this signature is prospective for Olympic Dam style alteration/mineralization.

The most recent bedrock mapping, which covers approximately half the survey area, was carried out by the Ontario Geological Survey (OGS) in 2000. Prior to this, the only bedrock mapping in the region was carried out during the mid 1970s at a reconnaissance scale, also by the OGS. Recent geochronological studies indicate the possibility that a major bedrock terrain boundary may cross the study area, with resultant development of orogenically thickened crust, a favourable setting for the intrusion of S-type granites (including pegmatites, peralkaline and alkalic intrusives).

The results of the analysis for PGEs by FA-ICP-MS has resulted in the identification of at least 14 new anomalies or anomalous areas. A number of these PGE anomalies feature coincident base metal anomalies (Cu, Cr, Ni) which enhances the potential that these anomalies may relate to nearby bedrock base metal sulphide mineralization. Several of the PGE ±base metal anomalies correlate with known mafic intrusive rocks, thereby providing a frame of reference for the interpretation of PGE anomalies in areas of poorly exposed/poorly understood geology.

The digital dataset has been published in conjunction with this OFR, and is available as MRD 98. The digital dataset includes the results of the sample re-analysis, the geochemical results of the additional sampling carried out 1993 and 1997, the original water limnological dataset and the original INAA dataset.

Wawang Lake--English River Lake Sediment Survey, Northwestern Ontario: PGE Data and Final Results/Interpretation of Lake Sediment Geochemistry

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Ontario Geological Survey
Open File Report 6076

2002

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Introduction

Fieldwork for a high density lake sediment geochemical survey of the Wawang Lake–English River area was carried out in July 1995 and July 1997. The survey covered most of National Topographic System (NTS) map areas 52 G/2, 52 G/7 and 52 G/10, which are located approximately 100 km northwest of Thunder Bay (Figure 1). This project was originally initiated to follow-up geochemical anomalies identified as part of the 90th meridian low density geochemical traverse (Fortescue and Dyer 1993). The data from the Wawang area samples taken during the 90th meridian traverse project have been included in this report.

A preliminary report was published in 1996 (Dyer and Breaks 1996) along with a digital data release (MRD 26). The present report contains the data generated from the re-analysis of all lake sediment samples by aqua-regia digestion, followed by analysis by ICP-MS and ICP-OES for approximately 45 elements. This was undertaken to attempt to confirm the original anomalies and to obtain data for several key elements (e.g., Pb, Zr) that were previously unavailable. Those samples with sufficient material remaining were also analyzed for Pd, Pt and Au by FA-ICP-MS. Also, geochemical data from in-fill sampling undertaken in 1997, and samples taken previously in 1993, has been added to the dataset, including data for gold by INAA. The digital dataset has been published in conjunction with this OFR, and is available as MRD 98.

Regional Setting

BEDROCK GEOLOGY

The study area is located within the central Wabigoon Subprovince of the Archean Superior Province. The most detailed and systematic bedrock mapping within the study area was carried out by the OGS in 2000 (Stone and Hallé 2000, Stone et al. 2000). This mapping covered almost all of the southern half of the survey area. A portion of the northern half of the study area was mapped at a reconnaissance scale during the early 1960s (Rogers 1964). Helicopter supported reconnaissance mapping (1" to 2 miles) by the OGS was carried out over the study area as part of Operation Ignace–Graham (Sage et al. 1974). Bedrock in the northern half of the study area has been mapped as predominately granite, granodiorite, quartz monzonite and migmatite. The southern half of the study area is underlain by a mixture of older Mesoarchean mafic to intermediate metavolcanics and granitic intrusives (Figure 2). Recent interpretations, aided by geophysical data, subdivide the migmatite into foliated and gneissic tonalite and indicate the presence of several small, younger felsic plutons in the southern half of the study area (Ontario Geological Survey 1991). The more detailed mapping by Stone et al. (2000) in the south-central portion of the survey area has further refined the extent and positions of the thin greenstone belts and identified several discrete mafic, peraluminous S-type and sanukitoid intrusive bodies. Rogers (1964), Sage et al. (1974) and Stone et al. (2000) have all noted the occurrence of abundant granite pegmatite dikes in the study area.

Recent geochronological studies and interpretations (e.g., Tomlinson et al. 1998) suggest the possibility that a major bedrock terrain boundary (or several boundaries), between older Mesoarchean crust and younger Neoarchean crust, may cross the central Wabigoon Subprovince.

① Wawang Lake-English River Survey Area (Dyer and Breaks 1996)

② Atikokan-Lumby Lake Survey Area (Dyer 1999)

③ Garden-Obonga Lake Survey Area (Jackson and Dyer 2000)

PHANEROZOIC

Limestone, dolestone, shale

ARCHEAN

Gneiss, granite, granodiorite, metasedimentary rocks

PROTEROZOIC

Diabase, sedimentary rocks

Metavolcanic and metasedimentary rocks

Figure 1: Location map of the Wawang-English River survey area

Such a boundary would cross, or be very close to, the Wawang study area. At such a boundary, the resultant development of orogenically thickened crust, provides a favourable setting for the intrusion of "fertile" granite-pegmatite systems, including rare-element pegmatites (Romer and Smeds 1997). For rare metal exploration, "fertile" granite-pegmatite systems are typically peraluminous and of S-type heritage (Breaks and Tindle 1997). Stone et al. (2000) has recently identified some peraluminous S-type granite dikes within the Wawang survey area.

This geological setting of an older basement complex abutting against a younger volcano-plutonic assemblage has drawn comparisons to the boundary between the Winnipeg River Subprovince and the western Wabigoon Subprovince (Beakhouse 1988; P. Thurston OGS 1999, personal communication), which is where the Avalon Ventures Ltd., Big Whopper rare metal deposit is located.

QUATERNARY GEOLOGY

Systematic detailed Quaternary geological mapping has not been conducted within the study area. Reconnaissance Quaternary mapping at a scale of 1:506 880 was completed by Zoltai (1965). Quaternary maps of the area at a scale of 1:100 000 were produced as part of the Northern Ontario Engineering Geology Terrain Study (NOEGTS) program (Mollard and Mollard 1980a, 1980b). These maps are based primarily on air photo interpretation with minimal ground truthing. A more recent regional compilation of the Quaternary geology for the area has been completed by Barnett et al. (1991). These sources indicate that surficial materials within the English River area are dominated by glaciofluvial sands and gravels, with lesser amounts of undifferentiated tills. Discontinuous, thin drift covers approximately 30 to 35% of the study area. Two prominent west trending moraines, the Lac Seul and Hartmann moraines, bisect the central and southern portions of the region, respectively.

Deposits of peat and muck are abundant within the map area. These are confined to bogs and swamps that occupy local topographic depressions, as well as lowlands adjacent to lakes and along the courses of meandering streams and rivers.

Streamlined landforms mapped by Mollard and Mollard (1980a, 1980b) indicate regional glacial ice flow direction was toward the south-southwest.

Methodology

FIELD WORK

During the 1995 survey, organic lake sediment samples were collected at 450 sites using a gravity corer, operated from a helicopter float. In order to avoid anthropogenic influences and diagenetic cycling in the near-surface sediments, only deep sediment (>20 cm below the sediment surface) was collected. In 1997, additional sampling of lake sediment at 19 lakes was completed in the same manner, although a new and updated gravity coring device was employed. In addition, 3 long cores were obtained, one of which was obtained using a modified Livingstone coring device. Geochemical data from the 20 to 30 cm interval from each of the long cores (samples 3019.2, 3020.2, 3021.4) has been included in this report and MRD 98.

Element	Analytical Method	Units	MDL	Lake Sediment (n=496)			Estimated Precision	LKSD-1 Reference Standard (n=20)		
				Median	Range			Certified Value	Mean Q.C. Result	Coefficient of variation (%)
					Min	Max				
Al	ICP-OES	ppm	30	12675	2930	31438	±4000	41300	6587	14.5
As	INAA	ppm	0.5	2.1	<0.5	19	±1.5	40	37.1	11.0
Au	FA-ICP-MS	ppb	3	<3	<3	11.4	n/a	5	<3	n/a
Au	INAA	ppb	2	<2	<2	40.0	±3	5	4	110.6
B	ICP-MS	ppm	0.3	3.2	<0.3	17.6	±2.0	49	6.2	22.3
Ba	ICP-MS	ppm	1	86	10	377	±35	430	110	29.1
Be	ICP-MS	ppm	0.1	0.4	<0.1	1.3	±0.3	1.1	0.2	27.4
Ca	ICP-OES	ppm	20	5280	1483	18000	±2000	77200	75069	6.7
Ce	ICP-MS	ppm	0.03	91.30	<0.03	14471	±250	27	24.31	25.3
Co	ICP-MS	ppm	0.05	8.90	0.05	70.02	±4	9	9.32	14.5
Cr	ICP-MS	ppm	1	27	<1	94	±18	12	17	27.7
Cs	ICP-MS	ppm	0.01	0.73	0.06	2.09	±0.3	1.5	0.60	16.6
Cu	ICP-OES	ppm	5	23	6	101	±5	44	50	6.5
Dy	ICP-MS	ppm	0.05	3.49	0.08	23.81	±3.5	3.4	2.28	16.9
Er	ICP-MS	ppm	0.01	1.76	0.02	14.57	±1.6	-	1.23	16.6
Eu	ICP-MS	ppm	0.05	1.16	<0.05	5.20	±0.08	0.9	0.64	19.0
Fe	ICP-OES	ppm	5	27115	2742	480080	±8000	18000	22342	6.8
Gd	ICP-MS	ppm	0.05	7.30	<0.05	72.91	±6.5	-	3.22	15.7
Hf	ICP-MS	ppm	0.05	0.16	<0.05	0.86	±0.15	3.6	0.11	21.5
Ho	ICP-MS	ppm	0.01	0.67	0.01	4.90	±0.4	-	0.45	17.0
La	ICP-MS	ppm	0.05	59.03	<0.05	>10000	±70	16	13.55	16.2
Li	ICP-MS	ppm	0.5	6.1	<0.5	31.4	±4.5	7	5.0	19.6
Lu	ICP-MS	ppm	0.005	0.24	0.01	2.60	±0.12	0.4	0.173	17.6
Mg	ICP-OES	ppm	20	1879	348	6897	±700	10300	7647	5.6
Mn	ICP-OES	ppm	1	265	37	3971	±80	460	513	6.5
Mo	ICP-MS	ppm	0.1	1.5	0.2	26.5	±0.8	12	11.2	14.6
Nd	ICP-MS	ppm	0.08	52.06	0.37	398.82	±50.0	16	15.06	15.8
Ni	ICP-MS	ppm	0.5	16.8	<0.5	41.15	±8	11	21.9	29.4
P	ICP-OES	ppm	50	826	216	5931	±200	900	837	6.4
Pb	ICP-MS	ppm	0.05	4.0	0.5	13.0	±1.6	84	78.98	18.0
Pd	FA-ICP-MS	ppb	0.3	1.3	<0.3	10.3	±0.8	n/a	1.5	n/a
Pr	ICP-MS	ppm	0.05	14.00	0.05	84.38	±18	-	3.52	15.7
Pt	FA-ICP-MS	ppb	0.3	0.9	<0.3	2.9	±0.5	n/a	1.0	n/a
Rb	ICP-MS	ppm	0.05	6.33	0.47	19.15	±3	24	4.58	16.9
S	ICP-OES	ppm	30	2820	528	24582	±500	15700	16873	10.3
Sb	ICP-MS	ppm	0.05	0.05	<0.05	0.28	±0.04	1.2	0.56	37.7
Sc	ICP-MS	ppm	0.1	5.2	<0.1	26.4	±4.0	9	4.8	19.8
Sm	ICP-MS	ppm	0.05	7.74	0.07	50.49	±9.0	4	3.02	17.2
Sn	ICP-MS	ppm	0.5	<0.5	<0.5	24.30	±0.35	16	2.9	43.7
Ta	ICP-MS	ppm	0.02	<0.02	<0.02	0.07	±0.014	0.3	<0.02	21.3
Tb	ICP-MS	ppm	0.05	0.91	<0.05	8.52	±1.0	0.6	0.46	15.8
Th	ICP-MS	ppm	0.05	6.34	<0.05	98.03	±7.0	2.2	1.53	15.4
Ti	ICP-OES	ppm	3	296	19	1052	±280	3010	520	20.0
Tm	ICP-MS	ppm	0.005	0.25	0.005	2.09	±0.2	-	0.177	19.6
U	ICP-MS	ppm	0.05	5.60	0.27	86.87	±4.0	9.7	9.89	14.3
W	ICP-MS	ppm	0.05	0.13	<0.05	0.81	±0.15	<4	0.62	27.0
Y	ICP-MS	ppm	0.05	19.28	0.25	>10000	±10	19	13.63	15.6
Yb	ICP-MS	ppm	0.05	1.59	0.05	15.66	±1.0	2	1.15	17.2
Zn	ICP-OES	ppm	2	84	13	311	±20	337	355	10.2
Zr	ICP-MS	ppm	0.1	4.3	0.1	22.6	±4.0	134	2.6	19.5
LOI	Grav.	%	0.01	40.7	8.3	75.8	±2	23.5	23.1	2.7

Notes:

1. ICP-MS= Inductively Coupled Plasma Mass Spectroscopy (aqua-regia digestion)
2. ICP-OES= Inductively Coupled Plasma Optical Emission Spectroscopy (aqua-regia digestion)
3. MDL=method detection limit.
4. Estimated precision at 95% confidence level;ICP-MS elements based on results of 69 duplicate pairs; ICP-OES elements based on 18 duplicate pairs; FA-ICP-MS elements based on 52 duplicate pairs
5. INAA=Instrumental Neutron Activation Analysis
6. Mean Q.C. Result = Average value, Wawang dataset.
7. Coefficient of variation at one standard deviation (68% confidence level)
8. LKSD-1 Canmet certified reference material; Reference values for Co, Cr, Cu, Fe, Mn, Mo, Pb, Sb, Zn determined by partial digestion; all others determined with total digestion.

Table 1: Summary of elements analyzed and quality control data, including estimates of precision.

A water quality probe was used at all sites to obtain *in situ* measurements of several parameters including pH, temperature, conductivity and dissolved oxygen. Readings were generally obtained at a water depth of 2 m. A GPS receiver was used for navigation and to record accurate sample site positions.

SAMPLE PREPARATION AND ANALYSIS

The lake sediments collected in 1995 were freeze dried and sieved to obtain the <100 mesh size fraction. The Ontario Geoscience Laboratory completed ICP-MS analysis following a Na_2O_2 fusion. Instrumental neutron activation analysis (INAA) was carried out under contract by Chemex Laboratories. The combined analytical methods provided data for 58 elements that comprised the original dataset published in 1996 as OFR 5940 and MRD 26. The re-analysis was completed in 1998 by the OGS Geoscience Laboratory. This involved aqua-regia digestion followed by ICP-MS and OES. The lake sediments collected in 1997 were prepared and analyzed in the same manner as those samples collected in 1995. In addition, these samples were analyzed by INAA, and the gold data is presented in this report.

Analysis for PGEs on the remaining sample material was carried out in 2000 by FA-ICP-MS. A total of 458 samples had sufficient sample material for this procedure.

Loss-on-ignition (LOI) was determined at 500° C using an automated thermogravimetric furnace.

QUALITY CONTROL PROCEDURES

Analytical precision and accuracy of the sediment analyses was monitored using: 1) 20 replicate analyses of a certified reference standard (LKSD-1); and 2) 32 field duplicates and 20 analytical duplicates randomly placed in the sample sequence. Duplicate pairs of data were plotted on an X-Y scatterplot and error bars fitted to estimate precision. Five percent of data points were allowed to fall outside of the error bars to approximate the 95% confidence level, assuming a normal distribution. Plotting of the LKSD-1 lake sediment geochemical results in time-series charts with the unknowns was done to detect possible analytical drift or batch to batch inconsistencies.

Table 1 summarizes the quality control results for the ICP-OES, ICP-MS and FA-ICP-MS methods, including estimates of precision. Elements determined to have unacceptable precision or problems such as analytical drift, have been excluded from the dataset. This includes the elements: Ag, Cd, Hg, K, Na, Nb, Sr, Tl and V. Only 2 INAA elements (Au, As) are shown in Table 1; all of the INAA data is included with the digital dataset (MRD 98). The precision for gold has been estimated at ±3 ppb. The resulting published dataset consists of 35 ICP-MS elements, 10 ICP-OES elements, 20 INAA elements and 3 FA-ICP-MS elements.

Considerations for Geochemical Data Interpretation

Factors to consider when assessing the possible significance of an anomaly are as follows:

1) Correlation with geology

In mineral exploration, correlation with geology is the most important factor when assessing the significance of a surficial geochemical anomaly, however, its relative importance declines as the known level of detail of the geology declines. Since much of the survey area has never been mapped in detail, many of the geochemical anomalies will help focus and prioritize future geological investigations.

2) Multi-site anomalies

Multi-site anomalies provide separate verification of the "anomalousness" of a given area and provide some insurance against non-systematic errors in sample quality, collection, preparation or analysis. However, since samples are collected, prepared and analysed in sequence, a uniform and numerically sequential anomaly may be the result of a systematic analytical or sample preparation error. This might be expected to produce an apparent geographic grouping of fairly uniform concentrations in one, or possibly several, elements. As mentioned above, every effort has been made to detect this kind of problem but the user is reminded to consider all available data when assessing the importance of an anomaly.

3) Multi-element anomalies

Multi-element anomalies with geologically reasonable elemental assemblages are useful in assessing the importance of many anomalies. For example, Pt and Pd, which are relatively immobile in the surficial environment compared to base metals such as Cu, Cr, Ni, Pb and Zn, would not be expected to be found in anomalous levels in a lake sediment without an accompanying base metal signature. Gold on the other hand, can occur in quartz vein deposits with little or no associated base metals; therefore, a gold anomaly by itself can be significant. But a gold anomaly with an associated base metal signature may be even more significant. However, certain multi-element anomalies (e.g., Mo + Zn) can sometimes result from limnological factors (e.g., redox conditions related to deep lakes, relative level of organic material in the sediment).

4) Magnitude of the anomaly

The magnitude of an anomaly, perhaps surprisingly, is one of the least important assessment criteria. Magnitude depends not only on the size of a deposit but on its distance from the lake, the presence and effectiveness of sinks between the source and lake, the limno-geochemical conditions in the lake, the weatherability of the deposit and the character of the surficial deposits (i.e., level of carbonate). The weatherability depends on factors such as exposure and/or depth of burial and on the specific mineralogy of the source. All these factors combine to make magnitude an unreliable estimate of the importance of an anomaly except in extreme cases or in cases where multiple samples and/or media corroborate its importance.

5) Correlation with Surficial Geology

Unconsolidated deposits can, under certain circumstances, cause a greater impact on the chemistry of lake media than can bedrock. Carbonate materials within eskers and thick ice-contact stratified drift deposits often result in relatively hard, alkaline lake waters. This type of lake water provides a geochemical matrix for trace elements which is very different to that of most shield lakes which are mildly acidic and organic-dominated. In general, most metals are

relatively immobile in such alkaline conditions, therefore geochemical anomalies might be considered more significant and possibly relatively close to source.

Dilution or addition to the trace metal signature in sediments can occur due to the presence of fine-grained unconsolidated material such as clay. Usually, the effect of glaciofluvial deposits (esker sands, gravels etc) is one of dilution of the trace element signature of interest (e.g. Cu, Ni, Zn) primarily due to an increase in the levels of the major elements (Si, Al, Mg, K, Na). In general, the sample collection and preparation protocols employed by the OGS, when properly carried out, minimizes the deleterious effects of exotic inorganic materials which may be present in the survey areas.

6) Redox conditions, lake depth and organic content

Not all spatial trends in geochemistry are due to lithological or mineralogical factors. The solubility of trace metals depends to a large extent on the geochemical matrix and in particular, on pH and oxidation-reduction (redox) conditions. Redox conditions in a lake are usually controlled by thermal conditions which, in turn, are controlled by lake morphology and lake depth. If conditions are suitable for an element to preferentially partition into the lake sediment, factors that may influence (enhance) the concentration of the element include the abundance of Fe, Mn and organic material. The mechanisms that may lead to "false anomalies" include sorption (scavenging) by hydrous oxides of Fe and Mn and the affinity of some elements to form organo-metallic complexes. Enrichment of some elements in the shallow (surface to 10 cm deep) sediment due to the upward migration and precipitation/ concentration of Fe and Mn (and other trace elements such as Co, Pb, Mo and Zn originally co-precipitated with Fe and Mn) can occur. The OGS sampling technique avoids the surface sediment and targets the deep (>20 cm) sediment thereby reducing/minimizing the effects Fe, Mn and base metal enrichment that may occur in the surface sediment, whether by redox cycling or by anthropogenic input. This assumes a similar sedimentation rate in all of the sampled lakes and the lake sediments deposited over the past several hundred years being undisturbed. This may not always be true. Sedimentation rates can vary depending on the energy of and the input to the depositional environment. Other factors to consider are sediment slumpage/mudslides, the effects of wavebase and the activities of animals. Therefore, the inadvertent collection of some "mixed" (shallow and deep sediment) samples is unavoidable.

Results

LAKE WATER

Average pH and conductivity for surface waters (depth 0 to 2 m) in the Wawang Lake–English River area are 6.9 and 42 µS/cm respectively. A broad west trending area of elevated pH is coincident, in part, with glaciofluvial ice-contact deposits (Lac Seul Moraine) in the central portion of the survey area. Another linear east-west zone of alkaline pH occurs west of the village of Graham. This zone is coincident with a belt of greenstone but also may be related to glaciofluvial deposits of the Hartmann Moraine which covers this area. These pH results may indicate the presence of a carbonate-rich matrix in these surficial deposits. A prominent zone of high conductivity in lake waters occurs to the west, north and south of Wawang lake. Presumably this pattern is related to high element loadings to the lakes from the surficial (Quaternary) deposits in the area.

LAKE SEDIMENT

In the discussion below, "elevated" is defined as elemental concentrations exceeding the 90th percentile, while "anomalous" is defined as elemental concentrations exceeding the 95th percentile of the data set for that element. The ± symbol is used to indicate an element that is either elevated or anomalous in only some of the samples within the anomalous area.

Proportional dot maps for the elements Au (INAA), Au (FA-ICP-MS), As (INAA), Be, Ca, Ce, Co, Cr, Cs, Cu, Fe, La, Li, Mn, Mo, Ni, Pb, Pd, Pt, Ta, Th, U, Y, Zn, Zr and REEs (Pr, Gd, Sm, Dy, Er, Tm, and Lu) are plotted on a generalized bedrock geology map of the study area (derived from Sage et al. 1974 and Stone et al. 2000) and are presented in Appendix A. Analytical data for the elements As, Au, Cr, Cu, Fe, Mo, Ni, Pb, Pd, Pt, total REEs, U, Zn and Zr are contained in Appendix B. The major points of interest derived from examination of the new data are as follows:

1) The anomalous patterns determined for the elements Be, Co, Cr, Cu, La, Li, Mo, Ta, Th, U, Y, and REEs by the original analysis and reported previously (OFR 5940) have been reproduced. This is particularly significant in that the original analysis was a total digestion which attacks/dissolves all sample constituents including any clastic (inorganic) component. The incorporation of all refractory grains (i.e., sand, silt and clay particles, dispersed largely by fluvial/clastic processes) in the analyzed sample could result in the false enhancement of some trace elements such as Be, Ta, Li, Y and REEs, elements that are thought to be relatively immobile by hydromorphic processes. The use of aqua-regia digestion (a strong partial digestion) for the re-analysis was an attempt to minimize this possible effect. Therefore, as would be expected, the absolute levels of the major elements (Al, Ca, Mg, and Ti), minor elements (Ba, Mn, P) and "immobile" trace elements (B, Be, Cs, Hf, Li, Rb, Sb, Sc, Sn, Ta, Th and W) of the aqua-regia dataset are significantly lower than that of the original (total digestion) dataset. Although the values are lower, the geochemical signatures of the anomalous elements/areas persist. Some elements (Co, Cr, Cu, Mo, Zn), thought to be transported in solution by hydromorphic processes (metal ions, soluble organo-metallic complexes, inorganic colloids) and bound in the lake sediment largely by organic material and hydrous metal (Fe, Mn) oxides, returned comparable values to that of the original total digestion dataset. Interestingly, the REEs had similar levels in both datasets, suggesting that they are not bound to the silicate phase or tied up in refractory grains.

2) New data for Pb and Zr (previously unavailable) show anomalous levels coincident with multi-element anomalous areas 1 and 2. This is significant as now the lake sediment geochemical signature almost completely resembles that which has been obtained over and down-ice of the Strange Lake rare metal deposit in Labrador. The strongest lake sediment anomalies associated with the Strange Lake deposit are for Be, Pb, REEs, Th, Y and Zr (McConnell 1988).

3) The lake sediment geochemical signature of anomalies 1 and 2 (REEs, ±U, ±Th) includes core zones of extremely anomalous Fe (up to 46% Fe). In addition, recent mapping by Stone et al. (2000) indicates the presence of fault/mylonitic zone(s) through these areas. Olympic Dam style alteration/mineralization is characterized by intense hematite/magnetite alteration, strong REEs and U enrichment and a distinct structural control (Hitzman et al. 1992; Hodgkison 1998). Therefore, anomalous areas 1 and 2 should be investigated for possible Olympic Dam style alteration/mineralization.

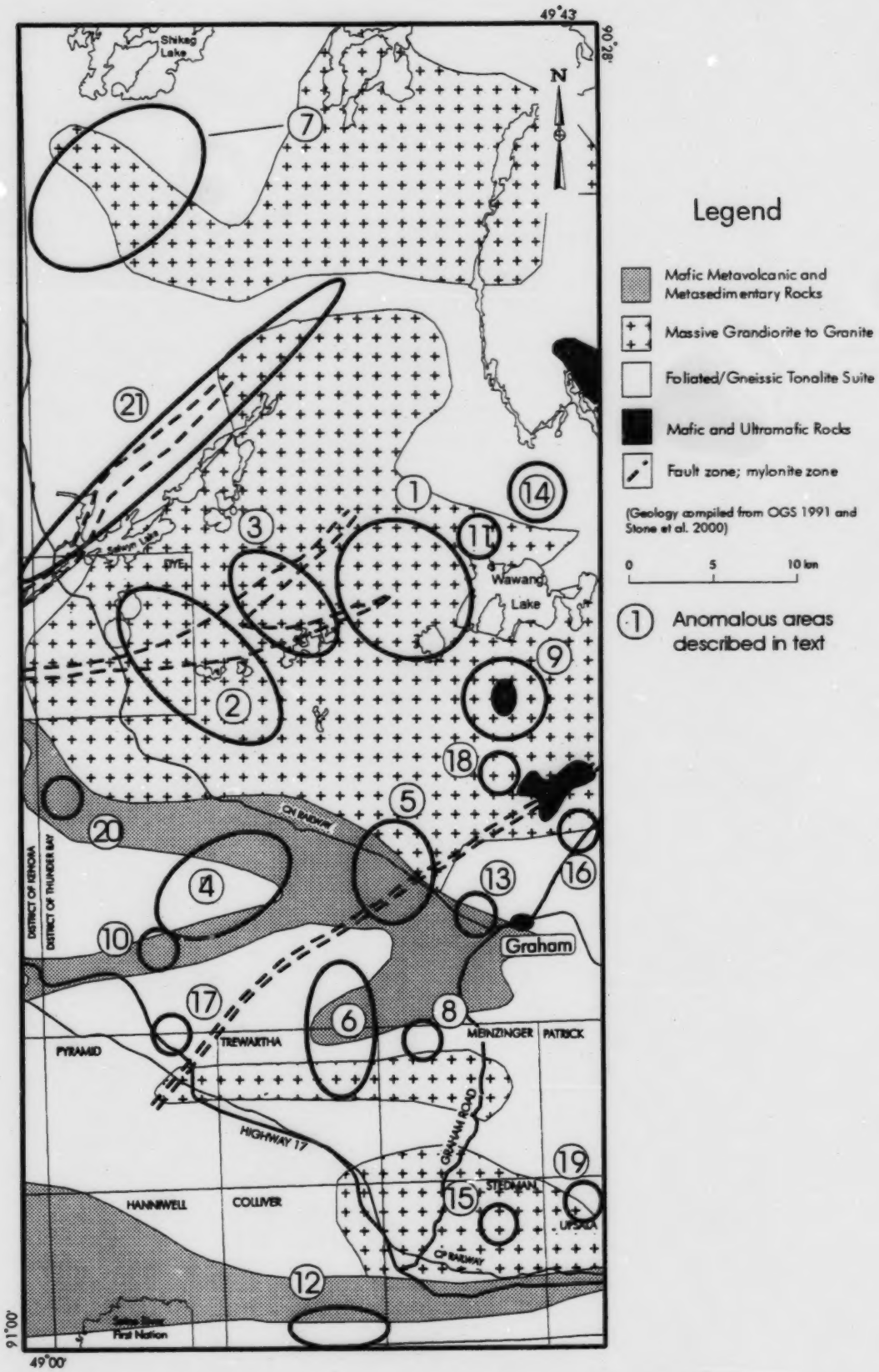

Figure 2: Generalized bedrock geology showing locations of anomalous areas.

			Ce	Dy	Er	Eu	Fe	Gd	Ho	La	Lu	Mn	Nd	Pb	Pr	Sc	Sm	Tb	Th	Tm	U	V	Y	Yb
Sample	EASTING	NORTHING	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB
Number			ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS	ICPMS
		Det. Limit--->	0.0004	0.0004	0.0004	0.0004	0.4	0.0004	0.0004	0.0004	0.0004	0.08	0.001	0.004	0.0004	0.004	0.0004	0.0004	0.008	0.0004	0.0003	0.003	0.0004	0.0004
1556	654921	5472286	0.545	0.020	0.011	0.007	333.1	0.052	0.004	0.292	0.002	7.67	0.246	0.205	0.067	0.43	0.038	0.008	0.037	0.002	0.040	0.70	0.124	0.012
1557	654480	5474356	2.691	0.067	0.032	0.019	1131.3	0.254	0.014	1.588	0.005	63.57	1.134	0.214	0.336	1.12	0.165	0.032	0.217	0.005	0.195	1.02	0.423	0.030
1558	653841	5476660	2.847	0.075	0.035	0.023	605.0	0.303	0.014	1.841	0.006	8.32	1.423	0.193	0.427	1.13	0.211	0.040	0.210	0.005	0.362	0.82	0.449	0.033
1559	655308	5476470	0.683	0.034	0.018	0.011	25.3	0.140	0.005	0.594	0.002	2.55	0.603	0.036	0.176	0.29	0.081	0.018	0.052	0.002	0.115	0.24	0.186	0.016
1561	655301	5475911	8.569	0.169	0.081	0.057	1269.4	0.843	0.031	5.333	0.013	68.08	4.097	0.253	1.238	1.43	0.599	0.113	0.522	0.010	0.674	2.09	0.949	0.074
1562	655454	5474743	3.235	0.074	0.040	0.025	1102.9	0.307	0.014	1.828	0.006	79.25	1.338	0.183	0.402	1.33	0.200	0.041	0.296	0.006	0.263	0.93	0.442	0.036
1563	656369	5473550	0.049	0.003	0.001	0.003	72.7	0.008	0.0002	0.042	0.0002	2.59	0.038	0.611	0.010	0.89	0.006	0.001	0.004	0.0002	0.012	0.04	0.014	0.002
1564	657893	5473320	4.317	0.153	0.078	0.043	554.9	0.547	0.029	2.983	0.012	12.77	2.629	0.226	0.758	1.18	0.410	0.074	0.356	0.010	0.297	1.47	0.852	0.075
1565	658992	5473534	1.892	0.049	0.028	0.014	336.6	0.178	0.009	1.059	0.004	6.13	0.781	0.146	0.240	0.14	0.119	0.024	0.152	0.004	0.118	0.80	0.295	0.025
1566	660219	5473885	2.206	0.073	0.045	0.020	1008.5	0.211	0.015	1.135	0.006	16.90	0.980	0.183	0.280	0.73	0.150	0.030	0.284	0.006	0.117	0.82	0.486	0.040
1567	660601	5473451	2.710	0.064	0.034	0.020	1077.3	0.229	0.012	1.540	0.006	62.36	1.072	0.721	0.315	0.97	0.152	0.032	0.343	0.005	0.079	0.52	0.413	0.036
1568	667580	5476736	0.698	0.056	0.038	0.014	195.3	0.160	0.011	0.695	0.006	2.53	0.665	0.066	0.186	1.44	0.110	0.023	0.026	0.005	0.299	0.37	0.420	0.037
1569	667541	5477374	0.670	0.022	0.011	0.009	398.7	0.064	0.004	0.304	0.002	23.03	0.275	0.252	0.079	0.24	0.045	0.009	0.054	0.002	0.018	0.55	0.137	0.014
1571	668477	5479259	4.192	0.097	0.058	0.026	1058.6	0.353	0.020	2.171	0.010	13.98	1.605	0.274	0.484	0.69	0.221	0.047	0.145	0.008	0.054	0.91	0.703	0.057
1572	669535	5480088	0.087	0.006	0.004	0.003	44.5	0.011	0.001	0.037	0.001	17.20	0.046	0.118	0.011	0.05	0.009	0.002	0.009	0.001	0.012	0.23	0.041	0.004
1573	670078	5480299	0.017	0.001	0.001	0.001	9.7	0.002	0.0002	0.008	0.0002	19.63	0.006	0.065	0.002	0.04	0.001	0.0002	0.004	0.0002	0.002	0.22	0.005	0.001
1574	670375	5480879	1.862	0.059	0.041	0.021	537.0	0.207	0.013	1.277	0.006	4.83	0.928	0.118	0.269	1.00	0.125	0.029	0.052	0.005	0.119	1.07	0.444	0.036
1575	669981	5479642	0.220	0.013	0.008	0.006	463.7	0.028	0.003	0.112	0.001	6.91	0.104	0.198	0.030	0.15	0.019	0.004	0.021	0.001	0.019	0.35	0.079	0.009
1576	669512	5479134	0.044	0.004	0.003	0.003	37.7	0.007	0.001	0.038	0.001	0.49	0.033	0.022	0.009	0.90	0.006	0.001	0.004	0.001	0.033	0.13	0.029	0.002
1577	669577	5478480	0.068	0.005	0.003	0.003	49.5	0.009	0.001	0.053	0.001	1.13	0.041	0.020	0.013	0.88	0.006	0.002	0.004	0.001	0.045	0.16	0.035	0.004
1578	670706	5477606	0.185	0.010	0.005	0.006	35.0	0.030	0.002	0.179	0.001	1.73	0.129	0.071	0.038	0.34	0.019	0.005	0.018	0.001	0.060	0.22	0.074	0.007
Wawang Survey		**mean**	**1.799**	**0.050**	**0.027**	**0.016**	**492.7**	**0.188**	**0.010**	**1.099**	**0.004**	**20.08**	**0.865**	**0.199**	**0.256**	**0.73**	**0.128**	**0.025**	**0.134**	**0.004**	**0.141**	**0.65**	**0.314**	**0.026**
(21 samples)		**median**	**0.698**	**0.049**	**0.028**	**0.014**	**398.7**	**0.160**	**0.009**	**0.695**	**0.004**	**8.32**	**0.665**	**0.183**	**0.186**	**0.88**	**0.110**	**0.023**	**0.052**	**0.004**	**0.080**	**0.55**	**0.295**	**0.025**
Atikokan Survey		**mean**	**0.294**	**0.016**	**0.009**	**0.008**	**128.4**	**0.039**	**0.003**	**0.208**	**0.001**	**4.83**	**0.182**	**0.122**	**0.050**	**0.49**	**0.029**	**0.005**	**0.022**	**0.001**	**0.042**	**0.28**	**0.099**	**0.009**
(2129 samples)		**median**	**0.164**	**0.011**	**0.007**	**0.007**	**76.6**	**0.026**	**0.002**	**0.142**	**0.001**	**1.484**	**0.125**	**0.036**	**0.033**	**0.42**	**0.021**	**0.004**	**0.016**	**0.001**	**0.029**	**0.20**	**0.076**	**0.007**
		95th percentile	**1.000**	**0.047**	**0.025**	**0.020**	**426.3**	**0.122**	**0.009**	**0.659**	**0.004**	**19.34**	**0.577**	**0.286**	**0.159**	**1.14**	**0.092**	**0.017**	**0.056**	**0.004**	**0.118**	**0.73**	**0.273**	**0.025**
Garden Lake Survey		**Mean**	**0.191**	**0.009**	**0.006**	**0.004**	**157.9**	**0.016**	**0.002**	**0.122**	**0.001**	**21.85**	**0.105**	**0.082**	**0.028**	**0.26**	**0.017**	**0.002**	**0.013**	**0.001**	**0.025**	**0.43**	**0.059**	**0.006**
(2138 samples)		**Median**	**0.088**	**0.006**	**0.004**	**0.003**	**81.7**	**0.010**	**0.001**	**0.068**	**0.001**	**8.41**	**0.062**	**0.025**	**0.016**	**0.22**	**0.010**	**0.001**	**0.007**	**0.0005**	**0.012**	**0.30**	**0.041**	**0.004**
		95th percentile	**0.725**	**0.030**	**0.017**	**0.011**	**543.1**	**0.061**	**0.006**	**0.431**	**0.003**	**79.03**	**0.356**	**0.252**	**0.100**	**0.70**	**0.055**	**0.007**	**0.040**	**0.002**	**0.083**	**1.20**	**0.183**	**0.017**

Table 2: Water geochemistry summary and comparison to Atikokan and Garden Lake survey areas

4) Coincident water geochemical anomalies for REE elements occur in areas 1 and 2. Water sampling, not undertaken during the original survey in 1995, was performed at 21 sites during the infill sampling in 1997. When compared to the water geochemistry of the adjacent Atikokan and Garden Lake surveys, completed by the OGS (Dyer 1999; Jackson and Dyer 2000), many of the values are extremely anomalous (See Table 2).

5) Within anomalous area 2, samples 3019.2, 3020.2 and 3021.4 returned gold values of 7, 40 and 4 ppb respectively. These 3 samples were obtained from the same location, approximately 0.5 km north of sample site 1516 (Figure 4, back pocket), which in the original report returned a value of 11 ppb. These results indicate that reproducible elevated to anomalous gold is present in the lake sediment at this location. In addition, gold values (determined by INAA) in the lakes immediately surrounding sample site 1516 range from 4 to 6 ppb. This data indicates a new anomalous area with potential for Au mineralization.

6) Anomalous PGE results correlate well with several recently identified gabbro and sanukitoid intrusive bodies. This correlation provides a frame of reference for other PGE ±base metal lake sediment anomalies that occur in areas of poorly exposed/poorly understood geology.

Figure 2 outlines the anomalous areas described below and summarizes the anomalous element assemblages. The first 7 anomalous areas were identified and discussed in OFR 5940, however, they are discussed here again in light of the results of the re-analysis. Anomalies 8 to 21 are new anomalous sites and/or areas. Figure 3 shows the approximate land tenure situation as of February 2002.

1) Axe Lake–McCausland River **REEs, Li, Y, Ta, ±B, ±Be, ±Cu, ±Ce, ±Cs, ±Fe, ±La, ±Ni, ±Pb, ±U and ±Zn**

This is the largest and most prominent of the anomalous areas defined in Figure 2, encompassing 10 lake basins, covering roughly 35 km^2 and spanning at least 3 drainage systems. Two of the drainage systems flow southwestward into the McCausland River, while the third flows northeast along the Ermine River. Anomalous elements in this area include: REEs (Pr, Sm, Gd, Dy, Er, Tm, and Lu), Li, Y, Ta, ±B, ±Be, ±Cu, ±Ce, ±Cs, ±Fe, ±La, ±Ni, ±Pb, ±U and ±Zn. The anomalous lakes include those from which samples 1008, 1009, 1010, 1016, 1018, 1069, 1071, 1072, 1073, 1223, 1568, 1571, 1574, 1576 and 1578 were taken. Refer to Figure 4 (back pocket) for the precise locations of sample sites. The concentrations of REEs in the Axe Lake–McCausland River area are as high as 10 times that of regional background. The most anomalous sample sites are 1010, 1072, 1568, 1571, 1574 and 1576, which form an elongate cluster from Axe Lake to Upper Grid Lake. This area lies close to an intrusive contact between granite and tonalite, and near 2 major northeasterly trending faults characterized by broad protomylonite zones (Stone and Hallé 2000). Stone et al. (2000) also identified a molybdenite bearing peraluminous dike near this area, which may, in part, explain some of the REEs geochemical signature in the lake sediments. However, the lake sediments in this area do not have anomalous concentrations of Mo. An unusual aspect of some of these anomalous sites is the extremely high level of Fe; for example sample 1571, a 1 m deep lake, returned a value of 27.7% Fe, while still containing abundant organic material as evidenced by an LOI of 45%. Regardless of whether this iron is of clastic or hydromorphic origin, or related to groundwater spring input, a significant source of iron, possibly iron sulphides, must be present in the area. One possibility, considering the presence of a significant fault structure and the abundance of REEs-U-Fe in the area, is the possibility of Olympic Dam style alteration/mineralization.

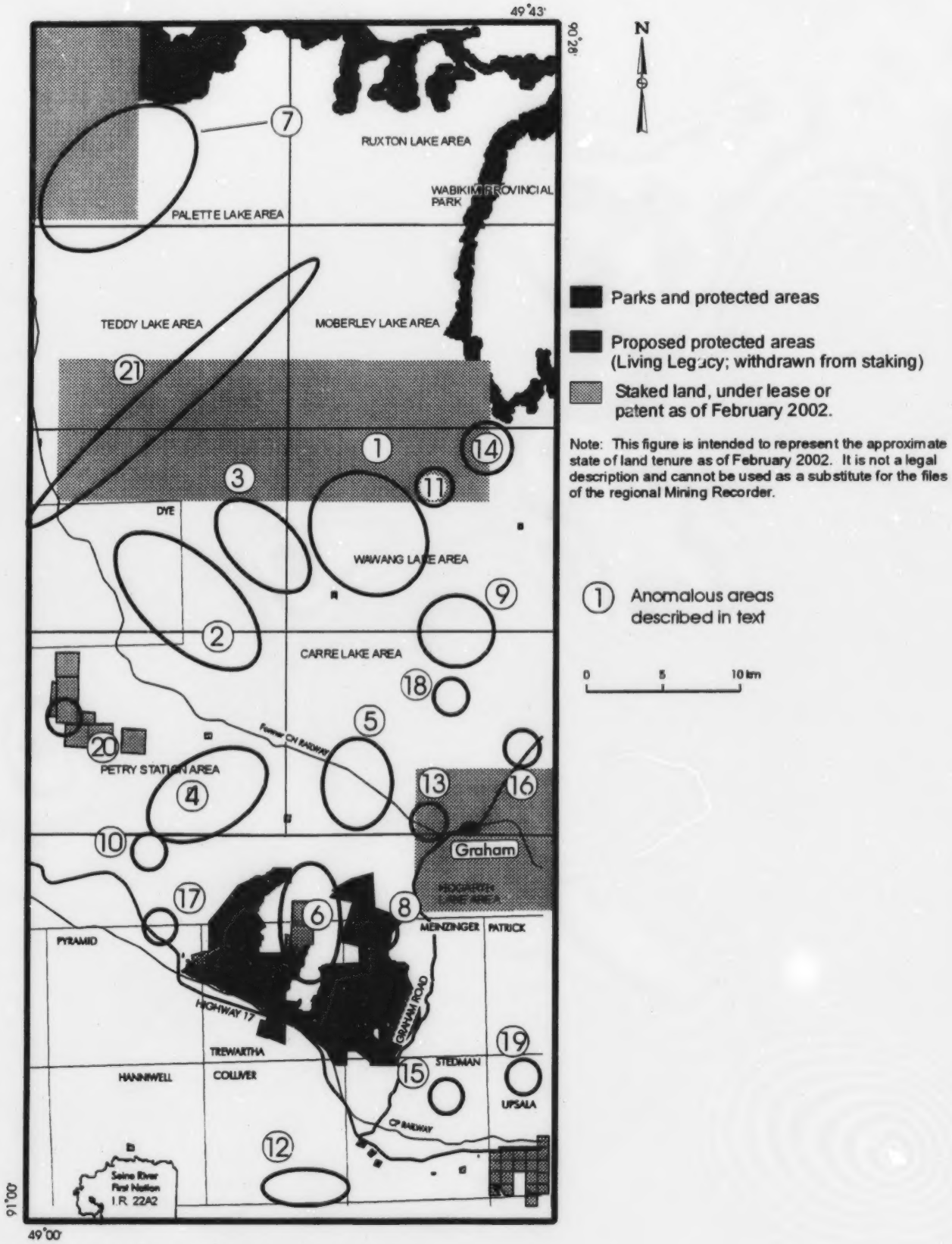

Figure 3. Approximate state of land tenure

Scanning electron microscope (SEM) studies of one dried lake sediment sample pulp (sample site 1014/1568; anomalous in REEs) from the Axe Lake–McCausland River area revealed the presence of fine discrete grains of quartz, plagioclase, K-feldspar, amphibole, ilmenite, titanite, sphene, monazite, zircon and possibly allanite. The presence of monazite would explain the presence of the light REEs (La, Ce) within the lake sediment, which could have originated from either a rare-earth type pegmatite, alkalic intrusive or peraluminous granite. This analysis clearly demonstrates that fluvial clastic transport can have an important impact on the geochemistry of organic rich centre basin lake sediments.

Sample site 1223, which is in the southern portion of this anomalous area, is strongly anomalous in Cr, Cu, Mo, Ni, U and has elevated Pd-Pt. Although the local bedrock geology is mapped as granite, this geochemical signature suggests the presence of mafic/ultramafic rocks.

2) Little Petry River REEs, Th, U, Mo, Fe, Zn, Zr, ±Be, ±Co, ±Cr, ±Cs, ±Mn, ±Sn, ±Ta, ±Y

Over 10 samples in this area are anomalous in REEs (Ce, Pr, Sm, Gd, Tm, ±Dy, ±Er and ±Lu), Th, U, Mo, Fe, Zn, Zr and several samples are strongly elevated to anomalous in Be, Co, Cr, Cs, Mn, Sn, Ta and Y. The lakes occur in 3 drainage systems, the most prominent of which is a west trending series of lakes including Little Petry Lake. The other affected drainages include the Little Petry River to the south and an unnamed drainage system further to the south. This anomalous area includes sample numbers: 1200, 1201, 1202, 1203, 1204, 1214, 1217, 1518, 1521, 1522, 1525, 1559, 1561, 1566 and 1567. The magnitude of the REEs, Th and Mo anomalies are very significant, ranging from 4 to 10 times regional background. Similar to the Axe Lake area (Area 1 above), extremely high Fe levels characterize some of the samples in this area; for example, sample 5154 returned a value of 42% Fe.

The highest gold value of 11 ppb (INAA) for this survey occurs within this area (sample 1516). Additional sampling on this lake, ~0.5 km north of sample 1516, returned gold values (INAA) of 7, 40 and 4 ppb (samples 3019.2, 3020.2 and 3021.4, respectively). These results indicate that reproducible elevated to anomalous gold is present in the lake sediment from this lake. In addition, gold values (also determined by INAA) in the lakes immediately surrounding sample site 1516 range from 4 to 6 ppb.

The underlying bedrock geology consists of a mixture of granite and tonalite (Stone et al. 2000). A prominent fault structure cuts across this area towards the northeast.

At the northwest end of this anomalous area, the original results from sample site 1156 included the highest Sn, Cu and Zn values for the survey (84.4, 3839.2 and 4112.3 ppm respectively). Re-analysis and resampling of this lake (sample 1558) failed to return any anomalous geochemistry.

3) Mettawi Lake REEs, Pb, Th, ±Cs, ±Hf, ±Y, ±La, ±Li, ±Be, ±U, ±Mo

At least 3 drainage systems are encompassed by the Mettawi Lake area, 2 of which drain to the northeast into the McCausland River and one to the west along Tide River. The element association here is similar to the Little Petry River area, with elevated to anomalous REEs, Cs, Th, Hf, Y, Pb, La, Li, Be, U and Mo. The light to medium REEs and Mo are strongly elevated to anomalous in at least 8 lake sediment samples from this area, including sample numbers 1144, 1145, 1160, 1161, 1166, 1196, 1197 and 5151.

Bedrock consists of a mixture of granite and tonalite and 2 prominent fault zones cross the area towards the northeast (Stone et al. 2000). The surficial geology consists of glaciofluvial material and discontinuous thin drift.

4) Rush Creek ±Cr, ±Pb, ±Ba, ±Ti, ±Li

Within this area, the lake sites 1317, 1321, 1324, 1366 and 5131 returned anomalous levels of some or all of the elements Cr, Pb, Ba, Ti and Li. These sites occur within 2 drainage systems that drain the same catchment area. There is very little outcrop exposure through this area. Available information (Stone et al. 2000; Sage et al. 1974) indicates this anomalous area is underlain by granite and tonalite intrusives, near a regional fold structure within the metavolcanic belt.

5) Oscar–Beach River REEs, Cr, Y, Sc, ±Au, ±Pd, ±Be, ±Cu, ±Ni, ±Ta, ±Zr

This area features anomalous levels of REEs, Cr, Y, Sc, ±Au, ±Pd, ±Be, ±Cu, ±Ni, ±Ta and ±Zr in a relatively tight cluster of 6 lakes (sample numbers: 1120, 1134, 1373, 1374, 1435, 5143). Four of these samples were collected from within a single drainage catchment. Two samples from the same lake (1120 and 1373) returned anomalous levels of Pd (3.7 and 4.1 ppb, respectively). This anomalous area is underlain by a mixture of mafic metavolcanics, tonalite and a sanukitoid intrusive body (Stone et al. 2000). The identification of a sanukitoid intrusive in this area coupled with the anomalous Pd in lake sediments makes this area a high priority for further investigation.

6) Little Trewartha Lake area REEs, Cr, Sc, Fe, ±Mn, ±Y, ±Be, ±Co, ±Ni, ±Pd

The geochemical signature in this area is similar to that described for the Oscar–Beach River area (REEs, Cr, Sc, ±Y, ±Be, ±Co, ±Ni). This anomaly occurs in 2 drainage systems, with 3 sites, 1351, 1353 and 1376 along the same drainage. Sample 1376 also returned anomalous Pd (3.5 ppb). All 3 of these samples feature anomalous Fe and Mn. To the south of this drainage, along Trewartha Creek, sample 1344 returned anomalous Pt, Cr and Co and elevated Pd. Stone and Hallé (2000) investigated this area and found it to be underlain by a mafic intrusive complex of Archean gabbro and Proterozoic diabase. Although they obtained negligible PGE values from bedrock grab samples, this area should be investigated more fully, especially in light of the Pd ±Pt anomalous lake sediment geochemistry.

7) Mottle Lake As, ±Cr, ±Co, ±Zr, ±Be, ±Cu, ±Ni, ±Cs, ±Zn, ±Mn, ±Pd

Samples in the Mottle Lake area are anomalous with respect to As, ±Cr, ±Co, ±Zr, ±Be, ±Cu, ±Ni, ±Cs, ±Zn, ±Mn and ±Pd. Anomalous As concentrations persist throughout the entire area, occurring in 9 lakes. Anomalous Cr concentrations occur in 4 of these samples, including one of the highest Cr values of the survey (Sample 1451, 82 ppm) within Mottle Lake itself. Anomalous Zn (209 ppm) also occurs in Mottle Lake. Two samples in this area (1272 and 1448) also returned anomalous Pd (4.0 and 4.3 ppb, respectively).

Although the bedrock in this area is mapped as felsic intrusive rocks (Sage et al. 1974), the lake sediment geochemical signature suggests a more mafic source, perhaps metavolcanics, or a mafic intrusion. The surficial geology in this area is a mixture of till, organic terrain and glaciofluvial material.

8) Antler Lake area **Pd, ±Pt, ±Ni, ±Cu, ±As, ±Cr**

This anomaly consists of a tight cluster of 3 sample sites (1427, 1428 and 1429) with elevated to anomalous Pd. Two of the sites (1427 and 1428) also have elevated to anomalous Cu and Ni. The highlight is sample 1428 which returned the highest Pd (10.3 ppb) and second highest Pt (2.6 ppb) values of the survey. A gold value of 4 ppb (INAA) and elevated As were also obtained from this sample.

Bedrock mapping by Stone and Hallé (2000) indicates this area lies near the contact between metavolcanics and granitic rocks (granite-grandiorite, tonalite). However, the lake sediment geochemical signature suggests the presence of mafic intrusive rocks. The recently identified mafic intrusive rocks at nearby Little Trewartha Lake (~5 km to the west) illustrates the potential for the existence of such rocks in this general area.

9) East Petry River area **Pd, ±Pt, ±Ni, ±Cu, ±As, ±Cr, ±Au, ±U, ±Be, ±Ca, ±Y, ±REEs**

This anomalous area consists of 5 anomalous sites that flank a mafic intrusion indicated on the bedrock map by Stone et al. (2000). On the west side, 3 separate lakes (samples 1080, 1138, 1139) returned elevated to anomalous Pd and Pt. The most interesting of these is sample site 1139, with 8 ppb Pd (second highest of survey), and anomalous Cu, As and U. Sample site 1080 also returned anomalous Ni and As (35.0 and 5.3 ppm respectively). In addition to elevated to anomalous Pd and Pt, sample site 1138 also returned a gold value of 6 ppb (INAA). On the east side of this area, 2 lake sites (1112 and 1113) returned elevated to anomalous Pd and Pt. In particular, sample site 1112 returned 6.2 ppb Pd, 2.4 ppb Pt and anomalous Ca, Cr, Cu, Ni, Y and REEs. The lake sediment geochemistry in this area supports the interpretation of the presence of a mafic intrusive, which warrants further investigation for potential PGE mineralization.

10) Southwest Rush Creek area **Pd, ±Pt, ±As, ±Cr, ±Co**

This anomalous area consists of a fairly tight cluster of 5 lakes (1322, 1325 to 1328), all with elevated to anomalous levels of Pd. Sample site 1325 is the most significant with 6.8 ppb Pd and anomalous Pt (2.6 ppb). However, apart from sample 1326 (elevated Cr, 51 ppm), the lack of any base metal signature (Cu, Ni) reduces the exploration significance of these anomalies. However, the area is underlain by metavolcanics and there is the possibility of the occurrence of mafic intrusive rocks. Thick overburden in this area, due to the presence of the Hartmann Moraine, may hamper prospecting efforts.

11) North Wawang Lake area **Pd, Pt, ±Ni, ±Au**

This is a single lake site (sample 1021) with anomalous Pd (6.4 ppb) and a gold value of 6 ppb (INAA). This sample was not re-analyzed by ICP-MS or OES; the original analysis returned only background levels of the base metals except for elevated Ni. Bedrock mapping by Stone et al. (2000) indicate the area is underlain by tonalite and granite.

12) South Colliver Twp area **Pd, Pt, Co, Ni, ±Cr**

This is essentially a single site Pd-Pt anomaly (sample 1395; 5.8 ppb Pd, 2.3 ppb Pt), combined with anomalous Co, Ni and 5 ppb Au (INAA). Three km to the east of this site, sample 5113 returned elevated Ni, Cr. Bedrock geology consists of trondhjemite-quartz diorite near the contact with metavolcanics (OGS 1991; Sage et al. 1974). Iron formation and pyrite-pyrrhotite showings have been identified in the nearby metavolcanic package.

13) Knuckle Lake area **Mo, ±Pd, ±Pt, ±As, ±Fe, ±Mn, ±Au**

This area is approximately 3 km west of the village of Graham and consists of 4 lakes with elevated to anomalous Mo, 3 of which have anomalous Pd (samples 1433, 1510, 1434; 5.5, 4.8, and 3.9 ppb, respectively). Several of the lake sediment samples also returned elevated to anomalous As, Fe and Mn levels. Sample 1510 is probably the highlight of the area, as it also has anomalous Cu (61 ppm) and 7 ppb Au (INAA).

This area straddles a greenstone-granite contact and mapping by Sage et al. (1974) indicates an occurrence of pyrite, chalcopyrite and pyrrhotite located near sample sites 1433 and 1434. This area also lies just to the east of a sanukitoid intrusion identified by Stone et al. (2000).

14) Ermine Lake area **Pd, Pt, Cr, Li, Ni, ±Cu, ±Pb, Cs**

One sample from Ermine Lake (sample 1044) returned anomalous Pd, Pt, Cr, Cs, Li, Ni (highest of the re-analysis), and elevated Cu and Pb. Levels of Fe and Mn are low and, therefore, are not a contributing factor to the base metal results. At sample site 1024, elevated Ni and weakly elevated Pd were obtained. The bedrock geology of the area is mapped as a mix of tonalite and granite intrusives (Stone et al. 2000), which have a prominent magnetic signature according to the OGS airborne geophysical compilation (Gupta 1991).

15) Stedman Lake area **Pd, Pt**

This is a single site Pd-Pt anomaly (sample 1410; 4.2 ppb Pd, 2.1 ppb Pt) located in the centre of the Stedman Lake pluton. Base metal (Cu, Ni, Cr) values are at background levels.

16) Fallscamp Creek area **Pd, Co, Cr, Ni, Cu, ±Au, As**

This is another single site Pd anomaly (sample 1094; 3.9 ppb), but with anomalous Co, Cr, Ni, Cu, As and 6 ppb Au (INAA). Levels of Fe and Mn are at background levels and therefore are not a contributing factor to these base metal results. The bedrock geology consists of granite-granodiorite, south of a large mafic intrusion mapped by Stone et al. (2000).

17) Northeast Pyramid Twp. **Pd, Cu, ±Co, Pb, Li, REEs**

This is a single site Pd anomaly (sample 1332; 3.7 ppb Pd), with anomalous Cu (101 ppm, highest of the re-analysis), Pb, Li and REEs. Levels of Fe and Mn are at background levels and therefore are not a contributing factor to these base metal results. The bedrock geology consists of biotite-tonalite to granodiorite, however, the lake sediment geochemistry is similar to that of anomaly #5 (Oscar–Beach River) where a sanukitoid intrusion occurs. Further exploration of this area would be relatively easy as it is close to Highway #17.

18) Little Carre Lake area **Pd, ±Pt, Cu, ±Ni,**

Two sample sites (1107 and 1108) on Little Carre Lake returned elevated to anomalous Pd (3.2 and 3.6 ppb, respectively). Sample site 1108 also returned anomalous Pt (2.1 ppb) and Cu (49 ppm), while sample site 1107 was anomalous in Cu (49 ppm) and Ni (31.9 ppm). Sample 1109, about 1 km to the northeast of Little Carre Lake returned anomalous Cu (48 ppm). The OGS bedrock compilation (OGS 1991) and mapping by Stone et al. (2000) shows that a mafic/ultramafic intrusive occurs to the east of this area. This lake sediment geochemistry may

be a reflection of this lithology. It is likely that very little bedrock outcrop exists in this area as it is covered by Quaternary deposits of the Lac Seul Moraine.

19) Northwest Upsala Twp ±Pd, ±Pt, ±Co, Cr, ±Ni

Sample site 1416 returned anomalous Pd (3.6 ppb), Pt (2.0 ppb) and elevated levels of Co, Cr and Ni. Sample 1417, taken approximately 1 km to the northwest of sample 1416, contains anomalous Cr. The bedrock geology consists of granitic rocks; abundant faulting in the area has been identified by Sage et al. (1974).

20) East English River area Pt, Au

This single sample Pt (sample 1234; 2.5 ppb) anomaly also returned 6 ppb Au (INAA). There is no coincident base metal signature, but the area is underlain by metavolcanic rocks and several pyrrhotite-pyrite showings have been identified nearby (Sage et al. 1974). Mapping by Stone et al. (2000) shows a gabbro intrusive body was identified less than a kilometer to the east of this lake site.

21) Selwyn Lake to Even Lake area Au

Within this elongate area coinciding with the trace of the northern extension of the Marmion Lake fault zone mapped by Stone et al. (2000), a number of lakes returned weakly anomalous to anomalous gold values. These are: 1151 (6 ppb), 1150 (7 ppb), 1177 (9 ppb), 1174 (5 ppb), 1468 (5 ppb), 1469 (11 ppb), 1505 (4 ppb), 1260 (6 ppb) and 1057 (5 ppb). All values were from the INAA analysis except for the 11 ppb in sample 1469, which was determined by FA-ICP-MS. The bedrock geology consists of a mix of granite and tonalite intrusives, however, no detailed mapping has been undertaken through most of this area.

Comparison of Lake Sediment Geochemistry at Wawang Lake and Strange Lake, Labrador

One of the few examples of the lake sediment geochemical expression of a REE and rare-element enriched pegmatitic granite comes from surficial studies of the Strange Lake Zr-Y-Nb-Be-REE deposit in Labrador. This deposit was discovered during follow-up investigation of lake sediment geochemical anomalies in 1979. Drill indicated reserves are reported to be 52 million tons with a contained value of 48 billion dollars (G. Stapleton, Newfoundland Department of Mines and Energy, 1997, personal communication). McConnell (1988) determined the elements Be, Pb, Th, Y, Zr and REEs showed significant enrichment and distinct down-ice dispersion patterns in lake sediments in the vicinity of the Strange Lake deposit. Other elements displaying a clear increase over background were Mo, U, Li, Zn, Rb, Mn and F.

The assemblage of anomalous elements at Strange Lake is quite comparable to several of the multi-element anomalies defined in this survey, in particular the Axe Lake–McCausland River area. Table 3 contains a comparison of the original total digestion geochemical data for the Wawang survey published in OFR 5940 and MRD 26, and the results of the Strange Lake survey (also total digestion data). For comparative purposes, the data for the Wawang Lake survey only includes sample sites within a 25 km x 31 km area centered on the main anomalous areas. The Strange Lake survey covered an area approximately 20 km x 35 km which included the Strange

Strange Lake Deposit Area Lake Sediment Survey			Wawang Lake Area Lake Sediment Survey		
Area of Survey = 700 km^2			Area of Survey = 775 km^2		
Number of samples = 106			Number of samples = 194		
Sample density = 1 per 6.6 km^2			Sample density = 1 per 4.0 km^2		
Element	95th Percentile	Geometric mean	Element	95th Percentile	Geometric mean
La	145	67	La	**250**	77.6
Ce	251	117	Ce	**380**	122.8
Sm	35.8	10.7	Sm	27	9.3
Tb	**9.3**	1.6	Tb	2.4	0.92
Eu	2.9	1.5	Eu	3.4	1.4
Yb	**24.8**	3.9	Yb	7.0	2.6
Lu	**3.0**	0.6	Lu	1.2	0.44
Be	**29.0**	1.5	Be	2.1	1.1
Nb	**43**	9.8	Nb	7.2	4.0
Th	32.4	7.9	Th	**61**	17.2
U	39.0	9.2	U	34.0	8.1
Y	**350**	47	Y	71.4	27.3
LOI	---	**15% (18.9%)**	LOI	---	**38.9% (41.2%)**

Note: all values in ppm except as noted. Second LOI value is arithmetic mean.

Table 3: Comparison of Wawang Lake area and Strange Lake area lake sediment geochemistry.

Lake deposit and the area down-ice of the deposit for a distance of about 35 km. Although the Strange Lake survey results show higher concentrations for many of the elements in Table 3, the average loss-on-ignition (LOI) was lower (18.9%). Loss-on-ignition is used as an estimate of the level of organic material in a sediment sample. Therefore, on average, the sampled lake sediments of the Strange Lake survey had a higher percentage of inorganic material. The elements in the list above are generally thought to be mostly associated with the inorganic phase of a lake sediment, occurring within refractory grains which have been mechanically dispersed into the lake basins. Statistical treatment of the dataset can help illustrate this. For example, one of the largest differences in the element abundances above is for Nb. In the Strange Lake survey, Nb demonstrates an affinity for the inorganic phase, because it has a good inverse correlation with LOI ($r=0.73$). Indeed, inspection of the dataset from the Strange Lake survey shows that the majority of samples that are elevated in REE, Be, Nb and Y have LOI values less than 20%, and many are below 10%. Therefore, it is possible that the higher REE and rare-element concentrations determined at Strange Lake are due to the higher level of inorganic material within the sampled lake sediments. The fact that a less vigorous extraction technique (aqua-regia digestion) used for the Wawang re-analysis confirms the anomalous patterns of the original analysis, and in the case of the REEs, confirms the absolute levels of the anomalies, adds to the significance of these anomalies and makes a comparison to the Strange Lake deposit more compelling.

Surficial sampling (B and C-horizon till) over and down-ice from the Big Whopper rare metal deposit in the Separation Lake area north of Kenora produced subdued anomalies for the elements Ba, Be, Cr, La, V and Zr (Robitaille 1994). Due to differing sample media and much lower and restricted sampling density at Separation lake, a direct comparison to the anomalies at Wawang Lake is tenuous. However, the anomalous element assemblage is similar and the greater anomaly contrast at Wawang Lake is encouraging from an exploration viewpoint.

Summary

Results of the Wawang Lake–English River lake sediment survey reveal the presence of at least 20 anomalous areas. Anomalies 1 to 3 are in the central part of the survey area, which is underlain by felsic intrusives. Anomalous elements include rare earth elements (REEs), Mo, Th, U, Y, Zn, Co, Cr, Fe and Sc. These areas have potential for rare-earth element pegmatites, molybdenite pegmatites, alkalic intrusions or Olympic Dam style alteration/mineralization. Comparisons with the lake sediment geochemistry near the Strange Lake REE-rare element deposit, located in Labrador, show many similarities. The stronger enrichment of some REEs and rare-elements in the Strange Lake survey may be related to a higher proportion of inorganic material within the lake sediment samples.

Anomaly 4 is spatially related to metavolcanics and metavolcanic-felsic intrusive contacts. The element assemblage in area 4 is similar to areas 1 to 3 with the exception of a lack of REEs. This area may have potential for rare-element pegmatites similar to those in the Dryden area which are depleted in REEs, or alkalic intrusions. Areas 5 and 6 have geochemical signatures high in REEs, Cr, Sc, ±Fe, ±Pd, ±Pt. These 2 areas are spatially associated with intrusive rocks (sanukitoid and gabbro) which are favourable hosts for PGE mineralization.

Anomalies 8 to 21 are primarily PGE anomalies, some of which have coincident elevated to anomalous base metal levels. The PGE anomalies with coincident Cu, Ni, Cr anomalies should

be considered a higher priority, particularly those in the vicinity of mafic intrusions, migmatitic rocks or greenstone belts.

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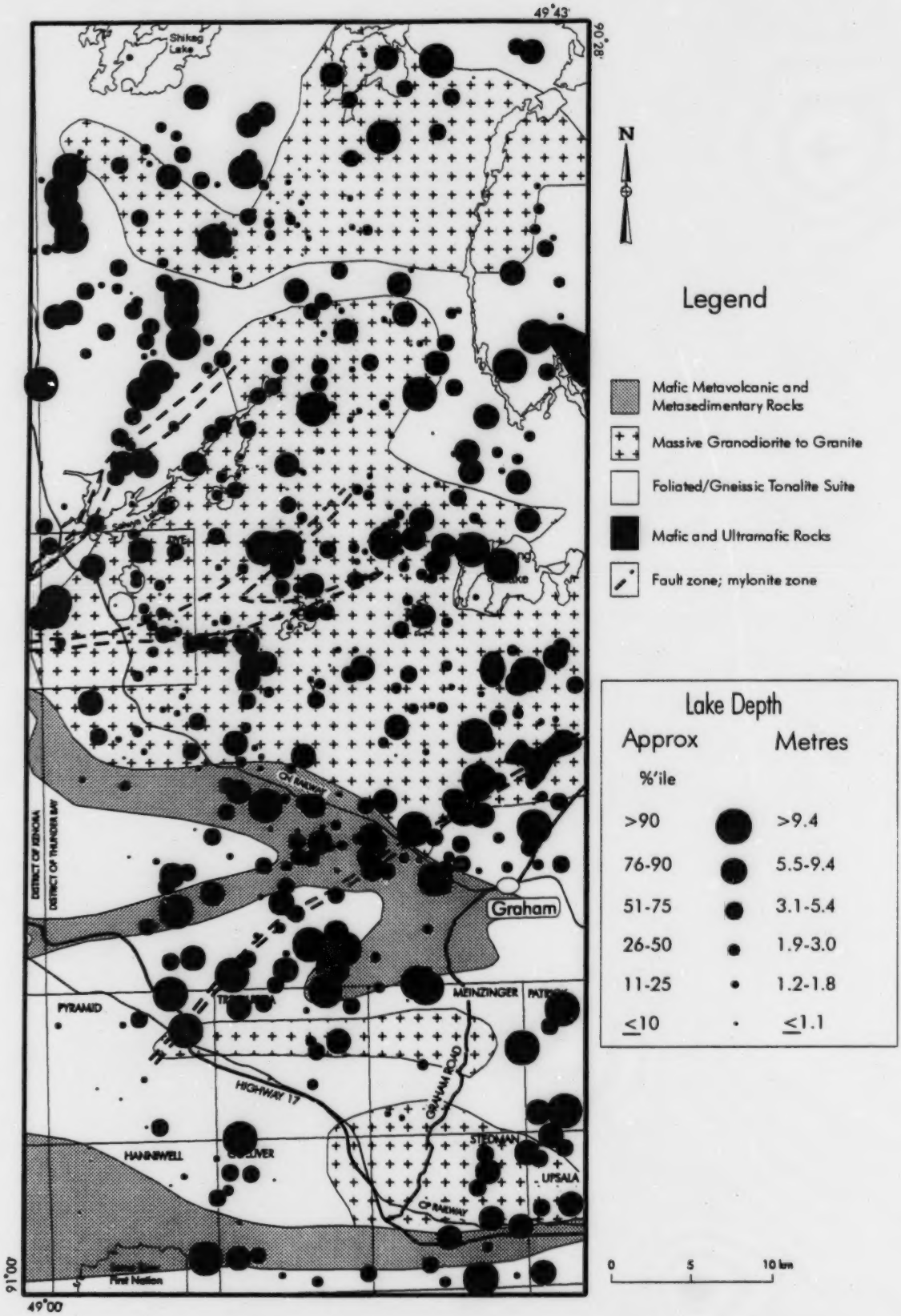
Appendix A

PROPORTIONAL DOT MAPS OF
LAKE SEDIMENT GEOCHEMISTRY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Shikag Lake
N
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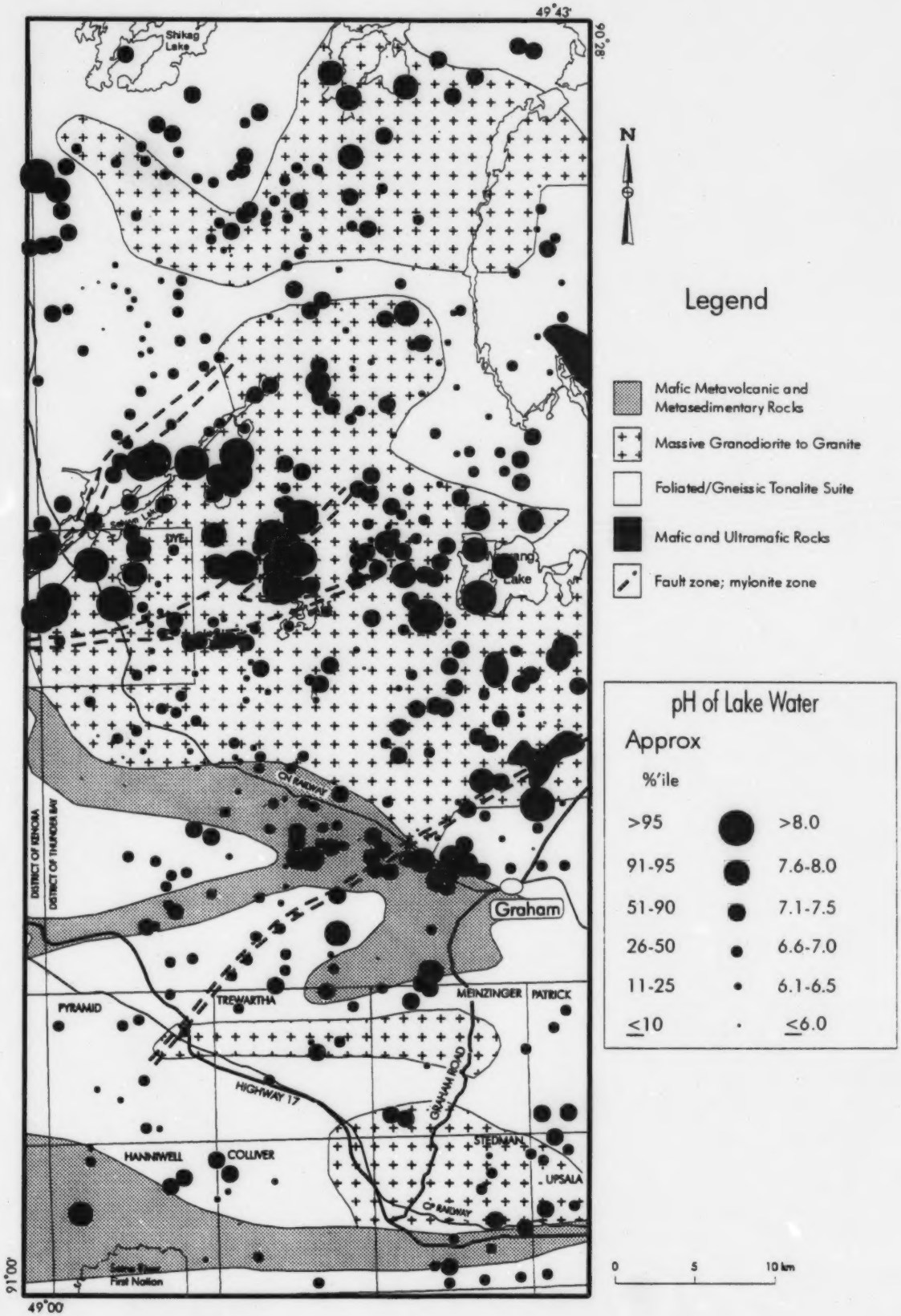
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Lake Depth
Approx %'ile
Metres
>90 >9.4
76-90 5.5-9.4
51-75 3.1-5.4
26-50 1.9-3.0
11-25 1.2-1.8
≤10 ≤1.1
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
MEINZINGER
HIGHWAY 17
GRAHAM ROAD
HANBIDWELL
STEDMAN
UPSALA
0 5 10 km
91°00'
49°00'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Shikag Lake
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Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
pH of Lake Water
Approx
%'ile
>95 >8.0
91-95 7.6-8.0
51-90 7.1-7.5
26-50 6.6-7.0
11-25 6.1-6.5
≤10 ≤6.0
DYE
Lake
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
CN RAILWAY
Graham
TREWARTHA
MEINZINGER
PATRICK
PYRAMID
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Sturgeon River First Nation
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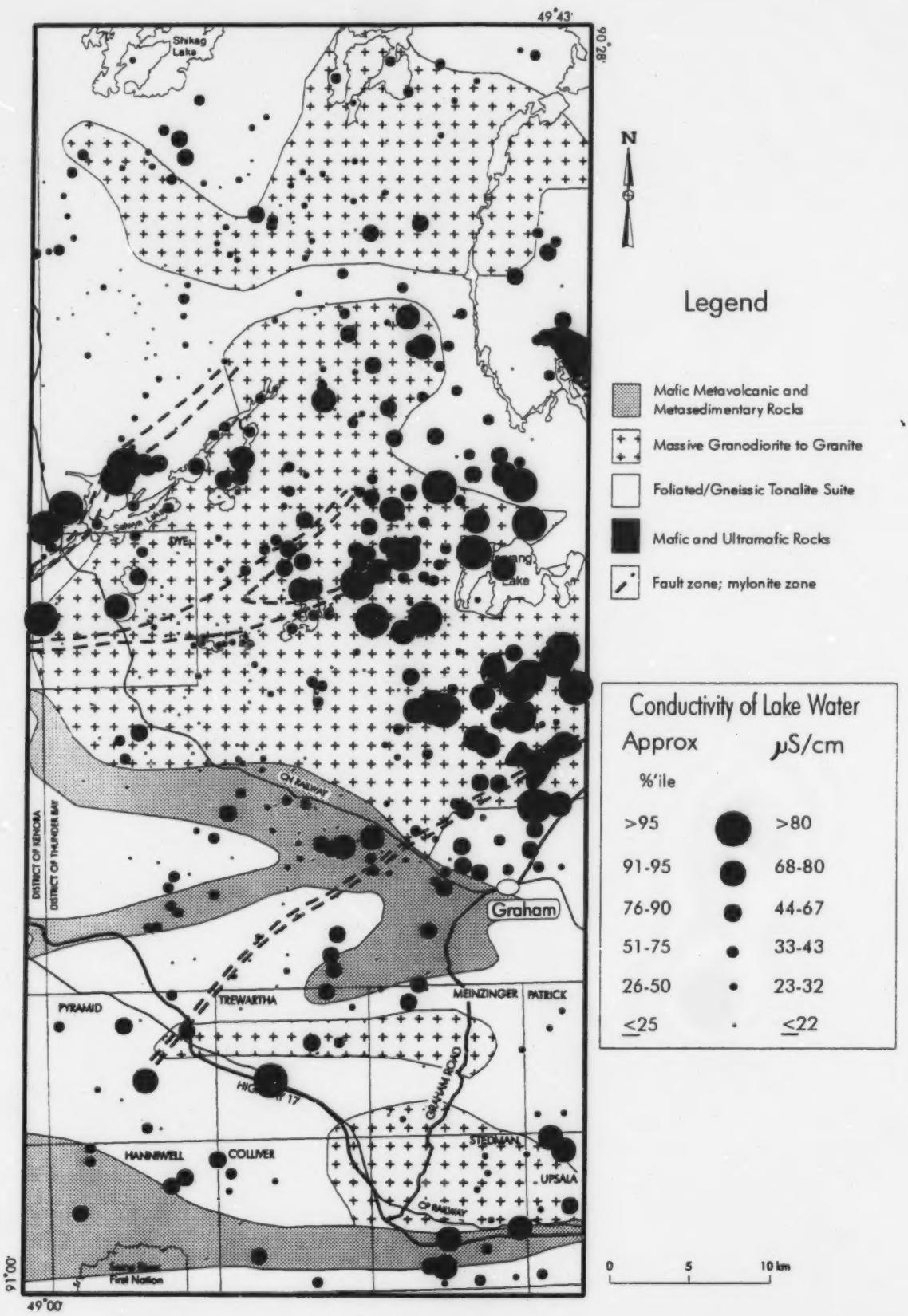
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Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Conductivity of Lake Water
Approx %'ile
µS/cm
>95 >80
91-95 68-80
76-90 44-67
51-75 33-43
26-50 23-32
≤25 ≤22
Graham
TREWARTHA
MEINZINGER
PATRICK
PYRAMID
HANBIDWELL
COLLVER
STEDMAN
UPSALA
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
0 5 10 km
91°00'
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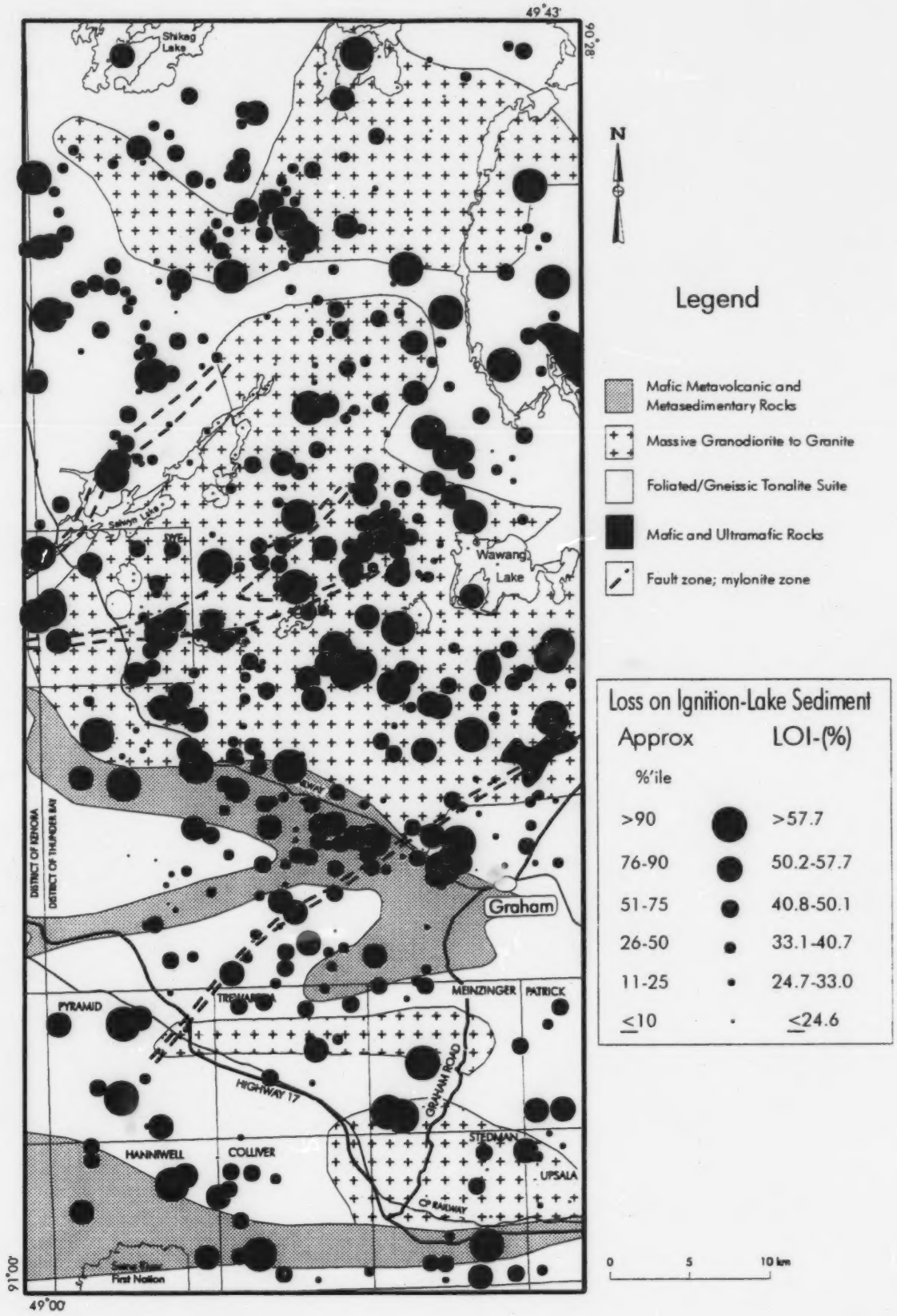
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90°28'
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TRIDAMAGH
MEINZINGER
PATRICK
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GRAHAM ROAD
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91°00'
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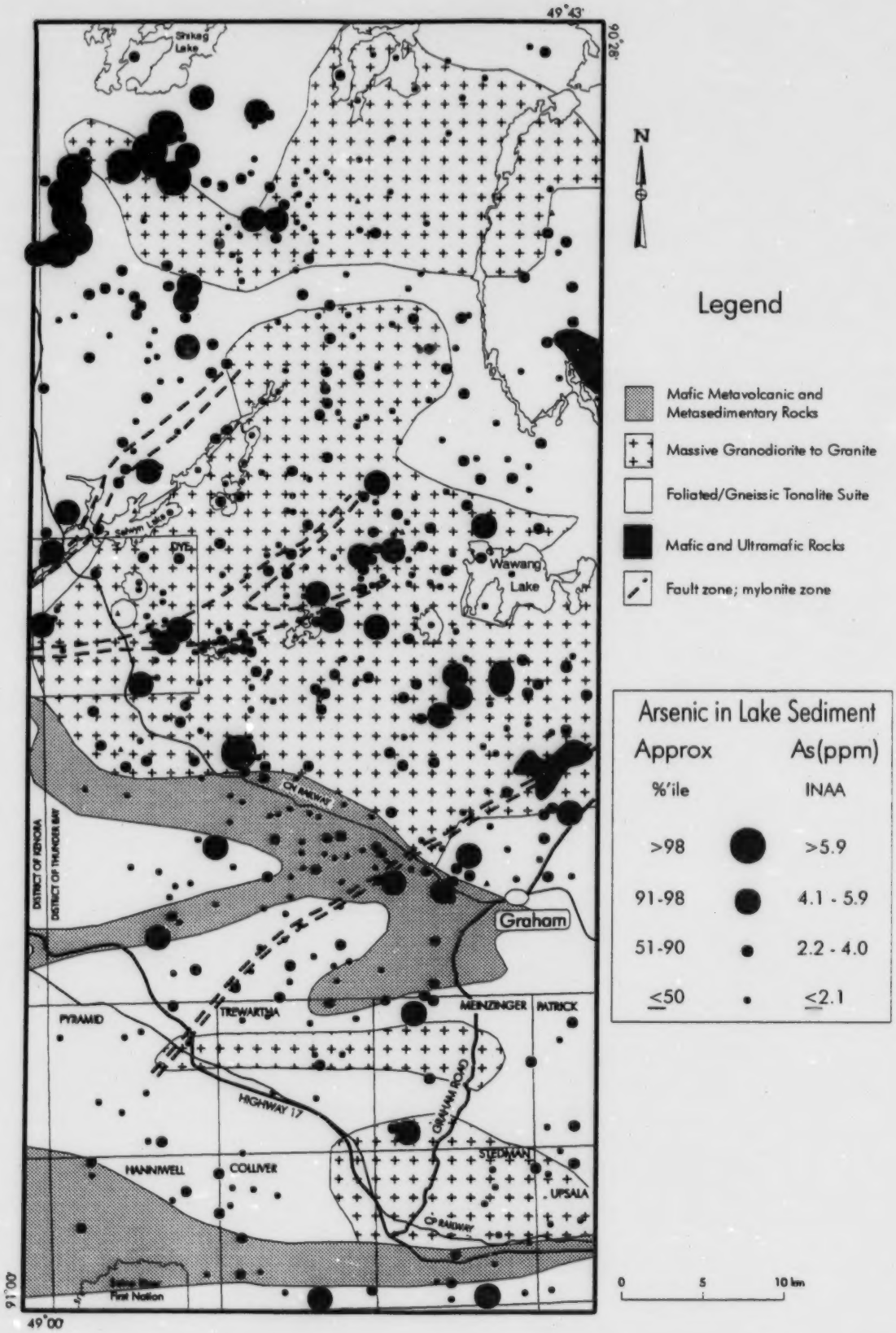
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Loss on Ignition-Lake Sediment
Approx %'ile
LOI-(%)
>90 >57.7
76-90 50.2-57.7
51-75 40.8-50.1
26-50 33.1-40.7
11-25 24.7-33.0
≤10 ≤24.6
0 5 10 km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Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
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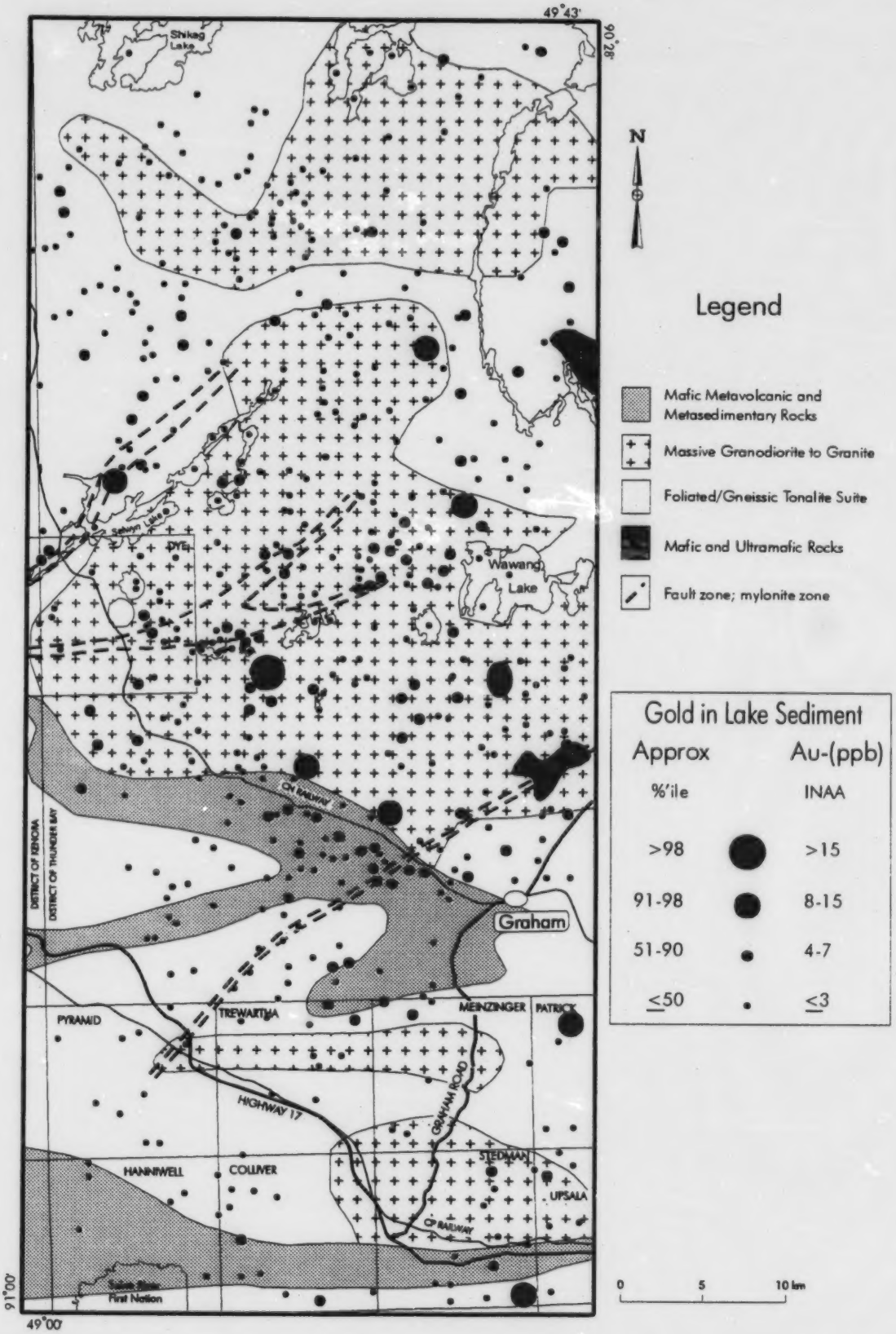
DYKE
ON HIGHWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
ON HIGHWAY
Arsenic in Lake Sediment
Approx %'ile
As(ppm) INAA
>98 >5.9
91-98 4.1 - 5.9
51-90 2.2 - 4.0
≤50 ≤2.1
0 5 10 km
91°00'
49°00'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Shikag Lake
Wawang Lake
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DISTRICT OF THUNDER BAY
Sabaskong First Nation
91°00'
49°00'
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Legend
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Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Gold in Lake Sediment
Approx %'ile
Au-(ppb) INAA
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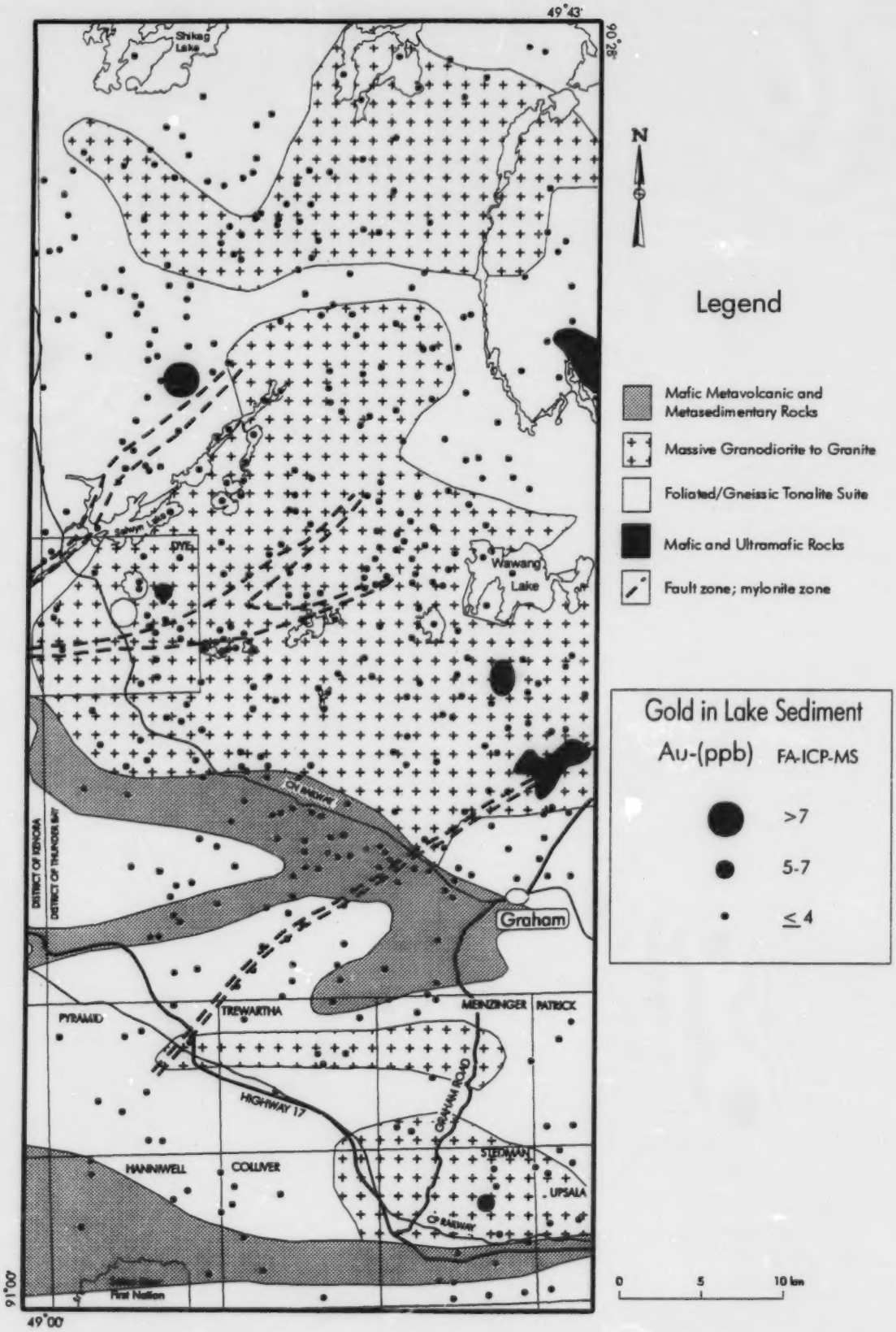
51-90 4-7
≤50 ≤3
0 5 10 km


49°43'
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Shikag Lake
Wawang Lake
Graham
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COLLIVER
STEDMAN
UPSALA
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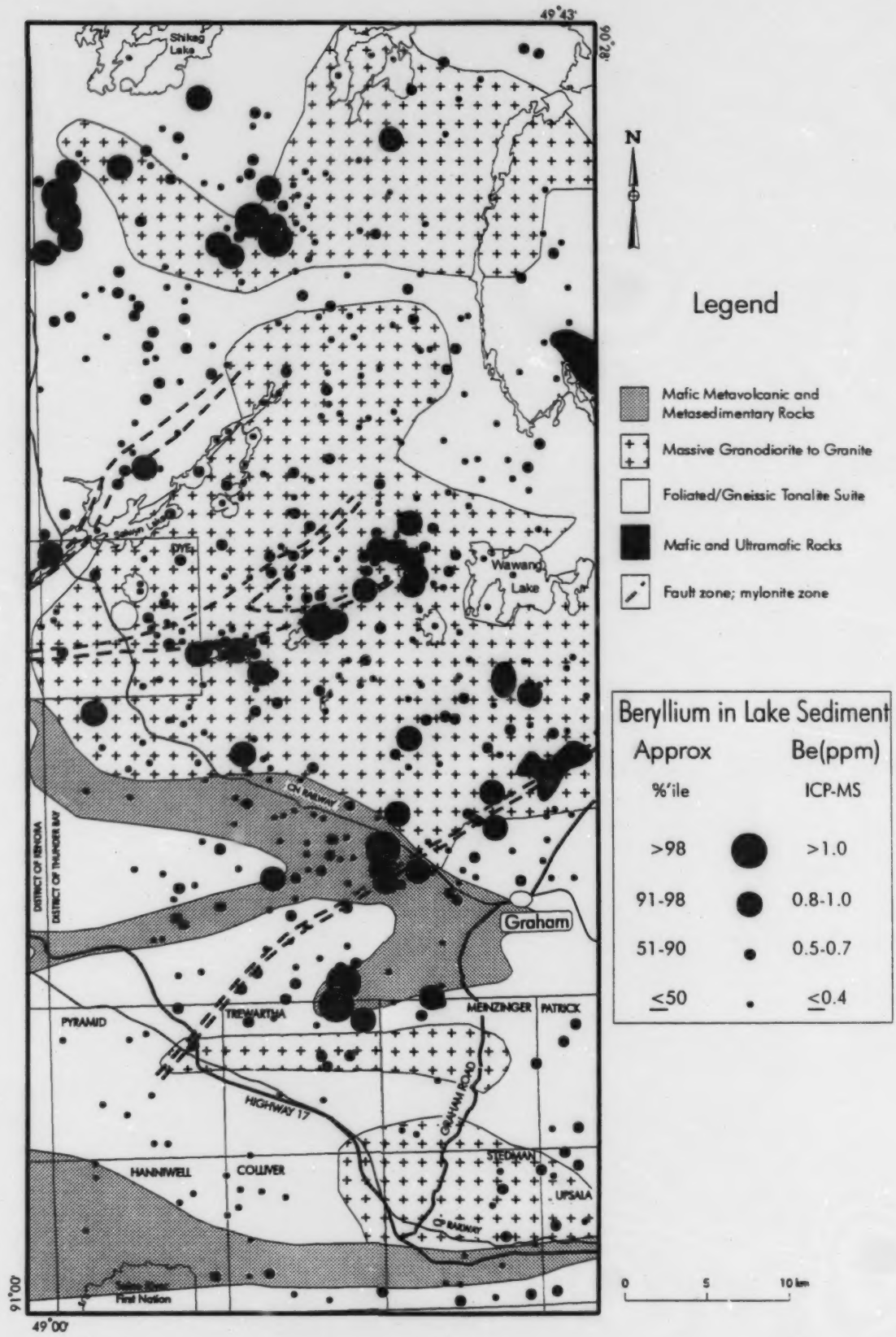
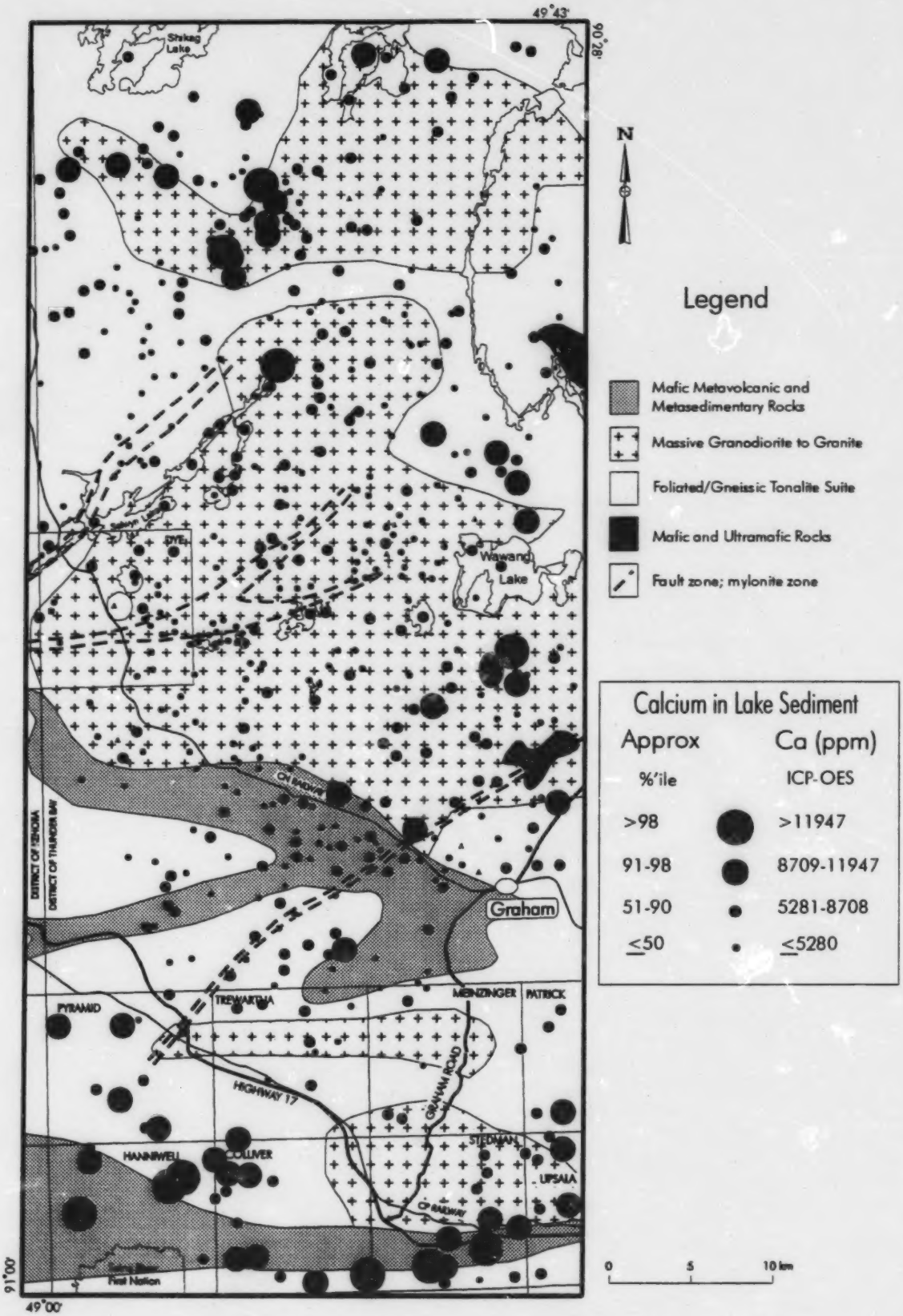
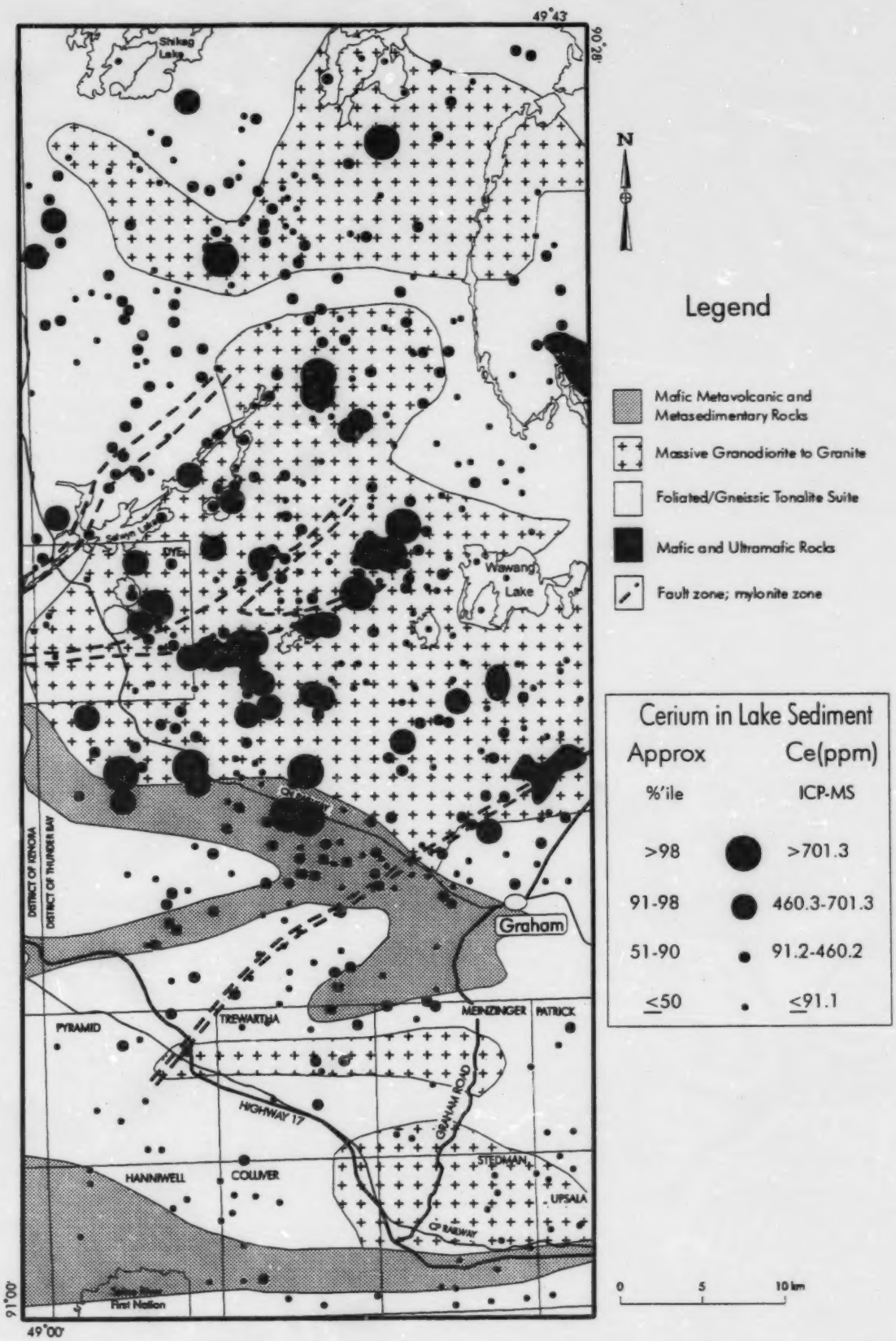
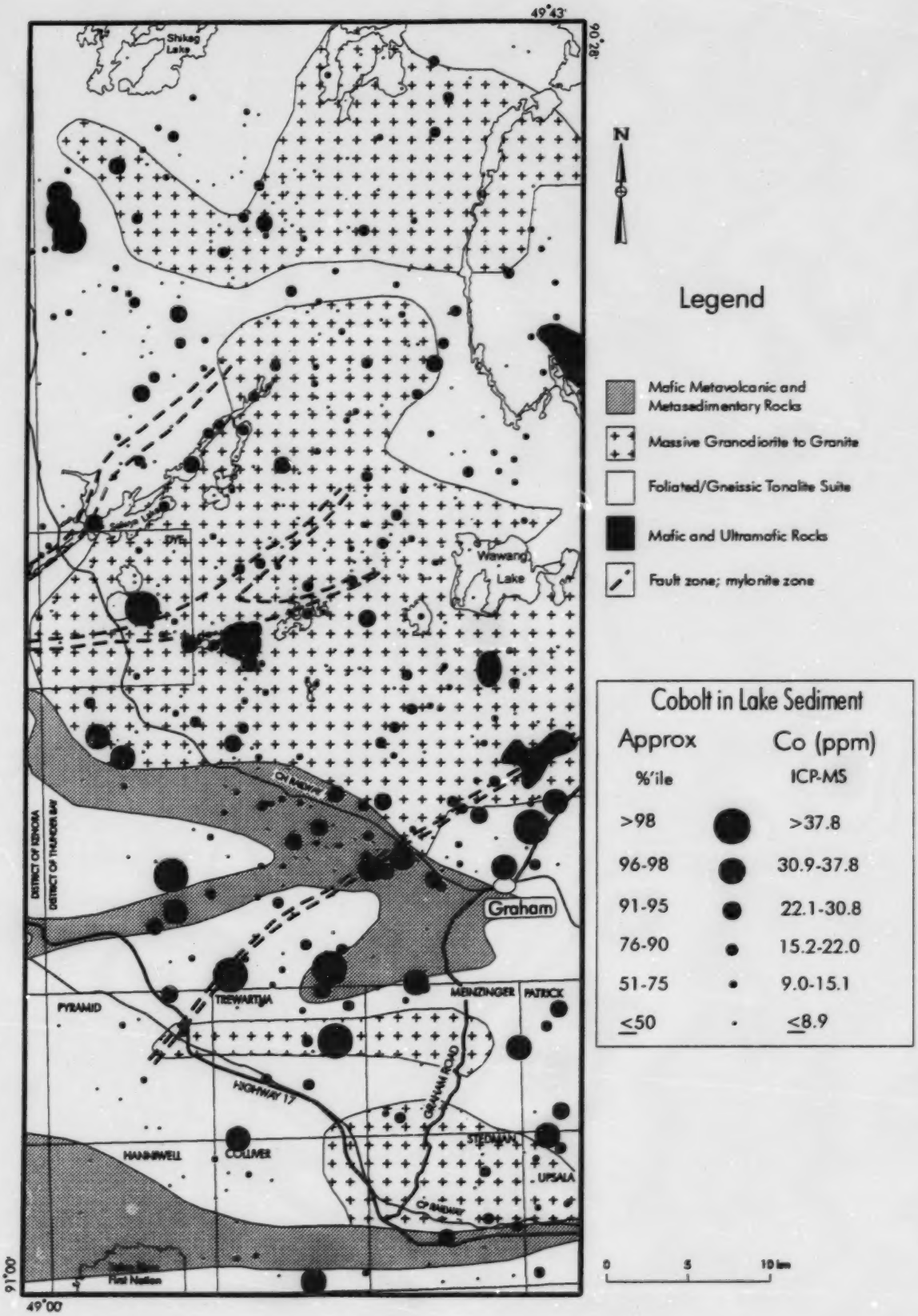
Gold in Lake Sediment
Au-(ppb) FA-ICP-MS
>7
5-7
≤ 4
0
5
10 km


49°43'
90°28'
Shikag Lake
Wawang Lake
DYE
ON RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREMARTHA
MERIZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
ON RAILWAY
Sabaskong First Nation
49°00'
90°16'
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Beryllium in Lake Sediment
Approx %'ile
Be(ppm) ICP-MS
>98 >1.0
91-98 0.8-1.0
51-90 0.5-0.7
≤50 ≤0.4
0 5 10 km

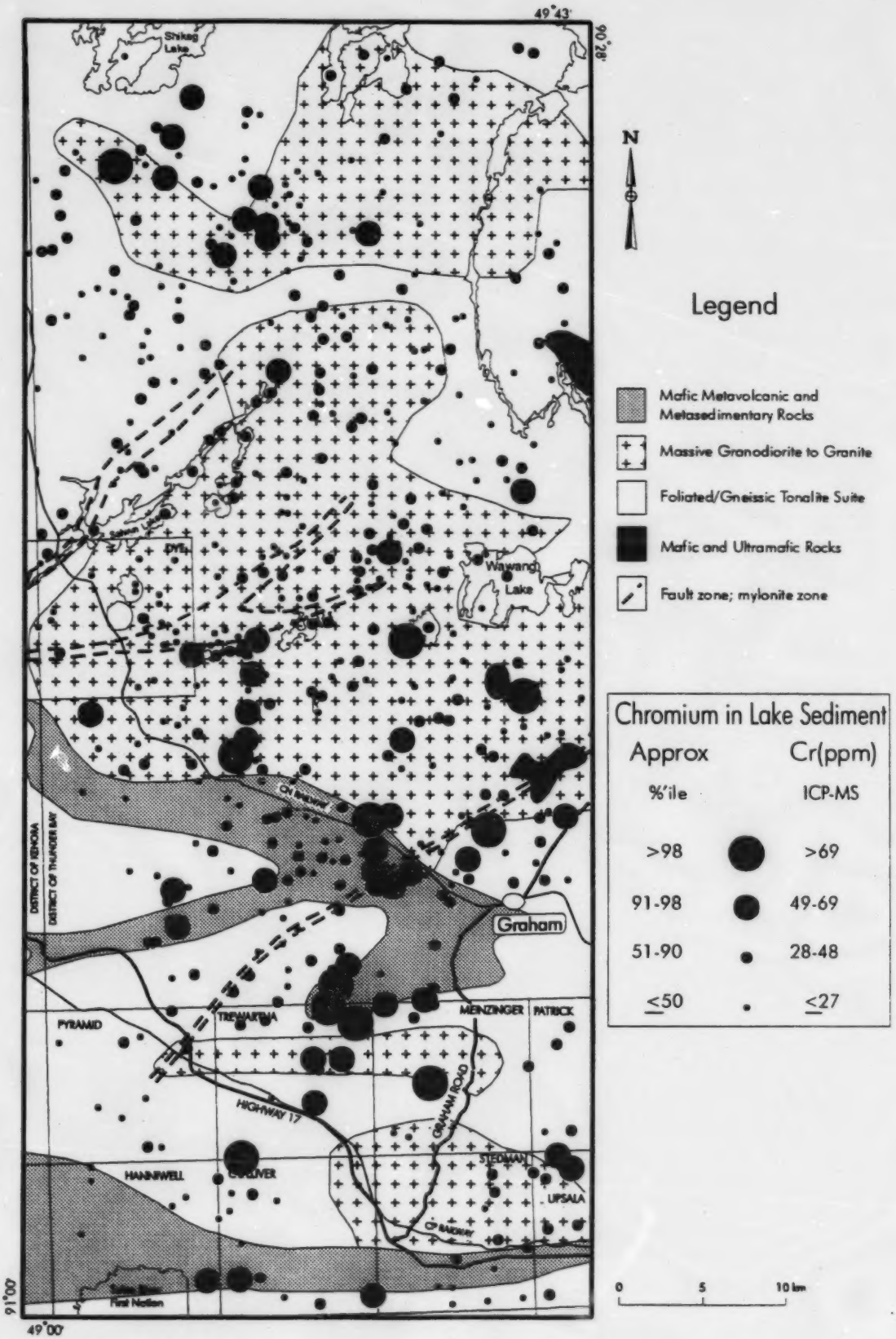

49°43'
90°28'
91°00'
49°00'
Shakeg Lake
Wawang Lake
DYER
DISTRICT OF SIOUX NARROWS
DISTRICT OF THUNDER BAY
ON HIGHWAY 17
Graham
PYRAMID
TREWARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
STEDMAN
HANNIWELL
COLLVER
UPSALA
ON HIGHWAY 17
First Nation
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Calcium in Lake Sediment
Approx %'ile
Ca (ppm) ICP-OES
>98 >11947
91-98 8709-11947
51-90 5281-8708
≤50 ≤5280
0 5 10 km

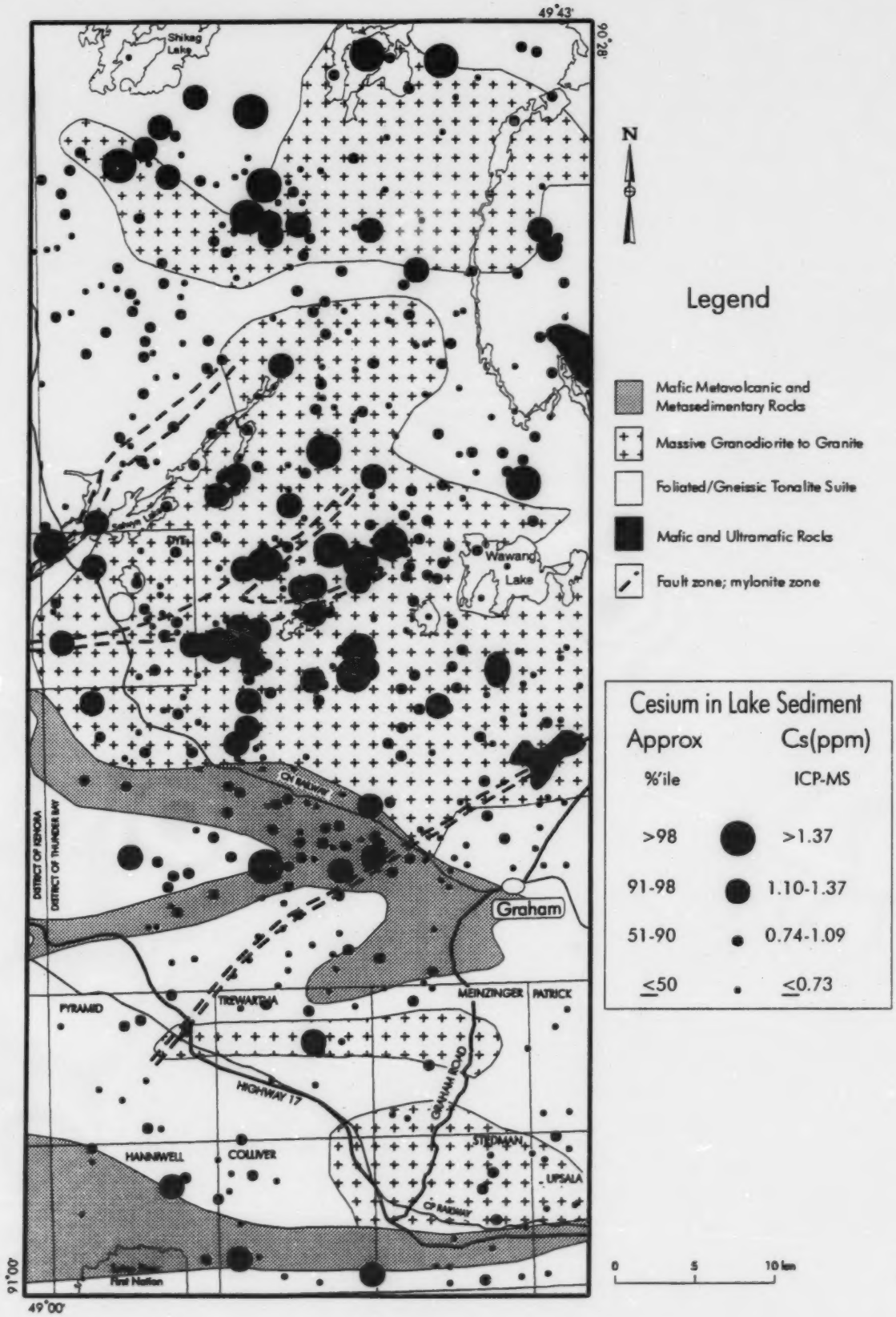

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TIREWARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLVER
STEDMAN
UPSALA
GRAHAM
Cerium in Lake Sediment
Approx %'ile
Ce(ppm) ICP-MS
>98 >701.3
91-98 460.3-701.3
51-90 91.2-460.2
≤50 ≤91.1
0 5 10 km
91°00'
49°00'

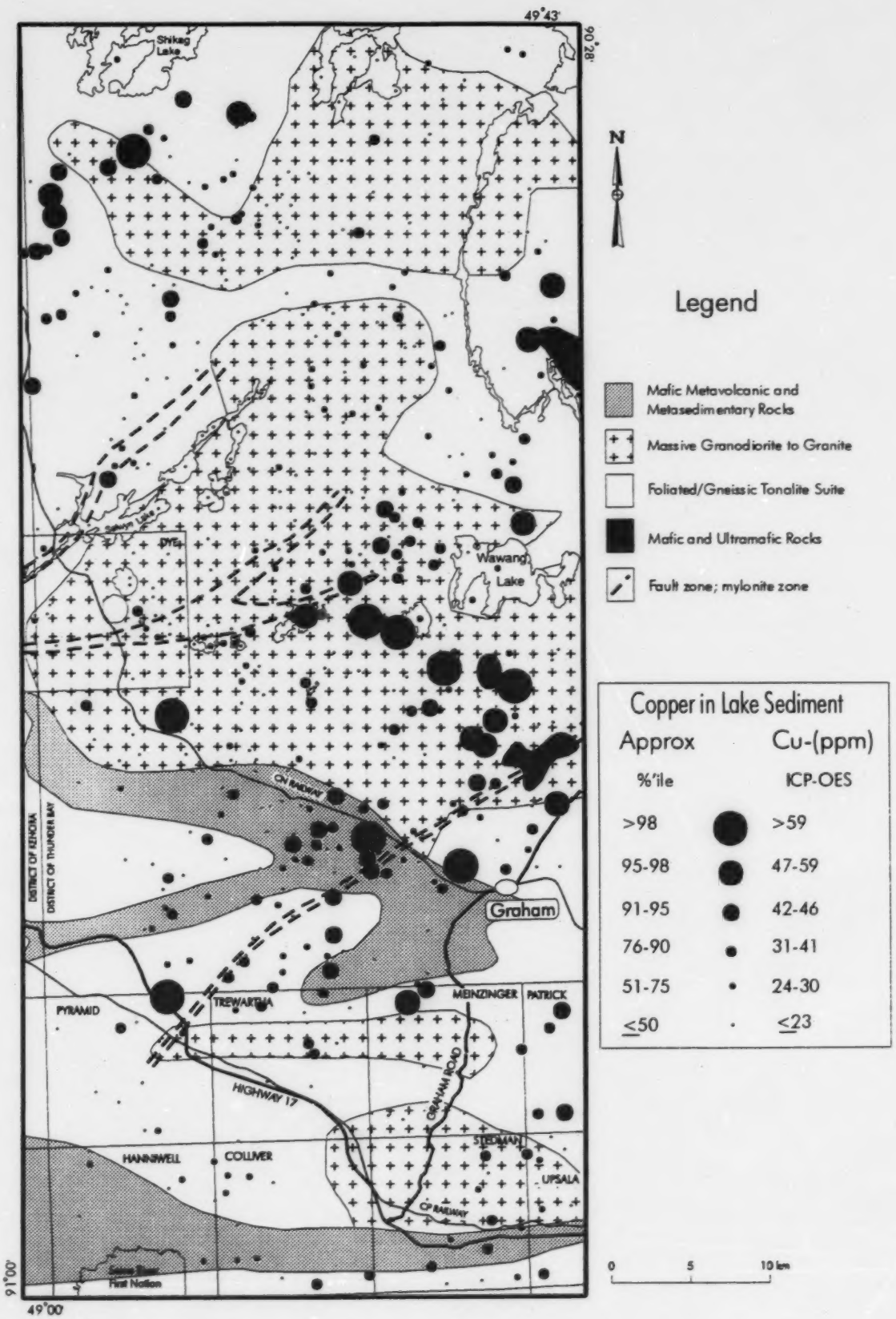


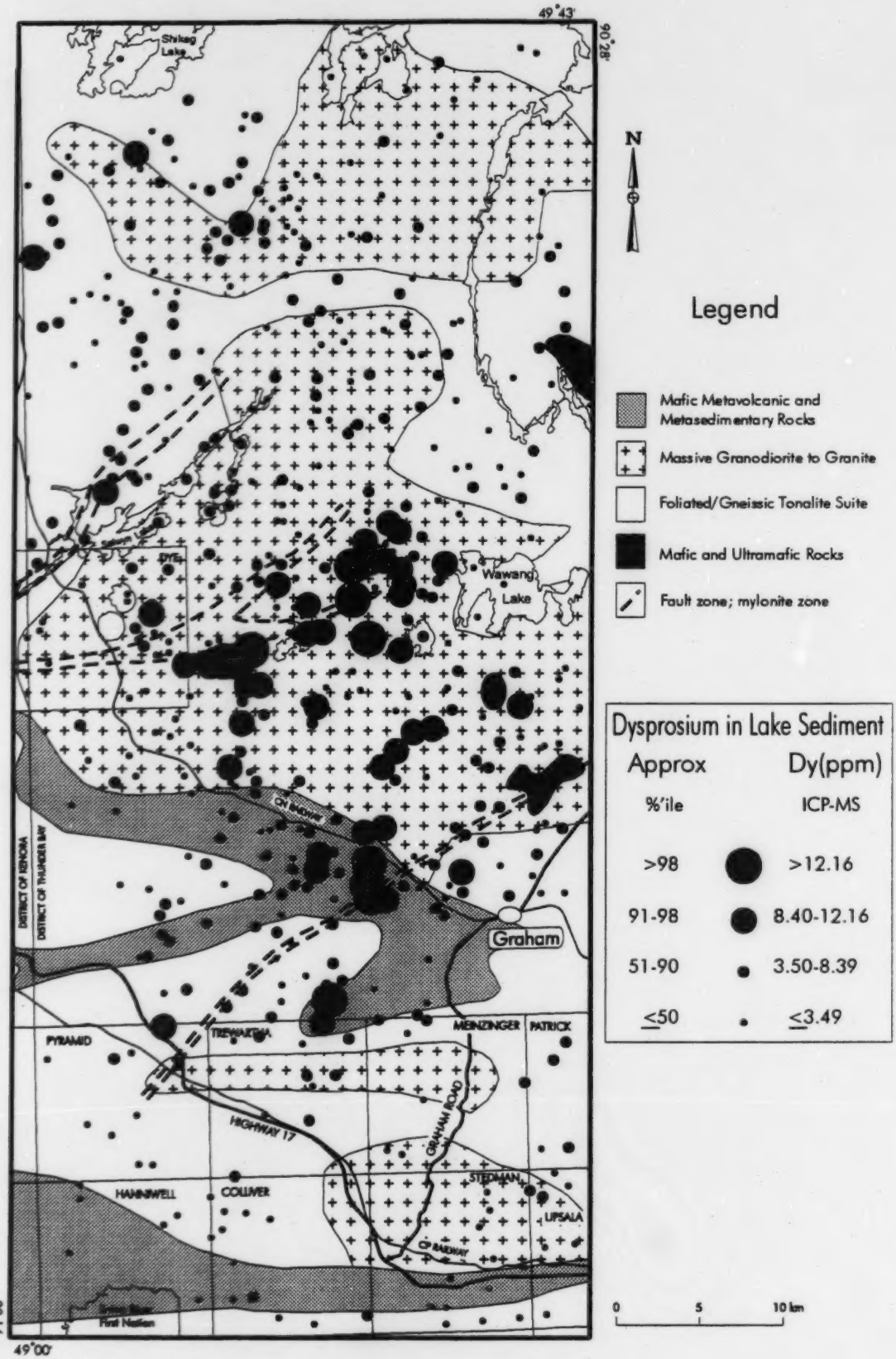
Cobolt in Lake Sediment

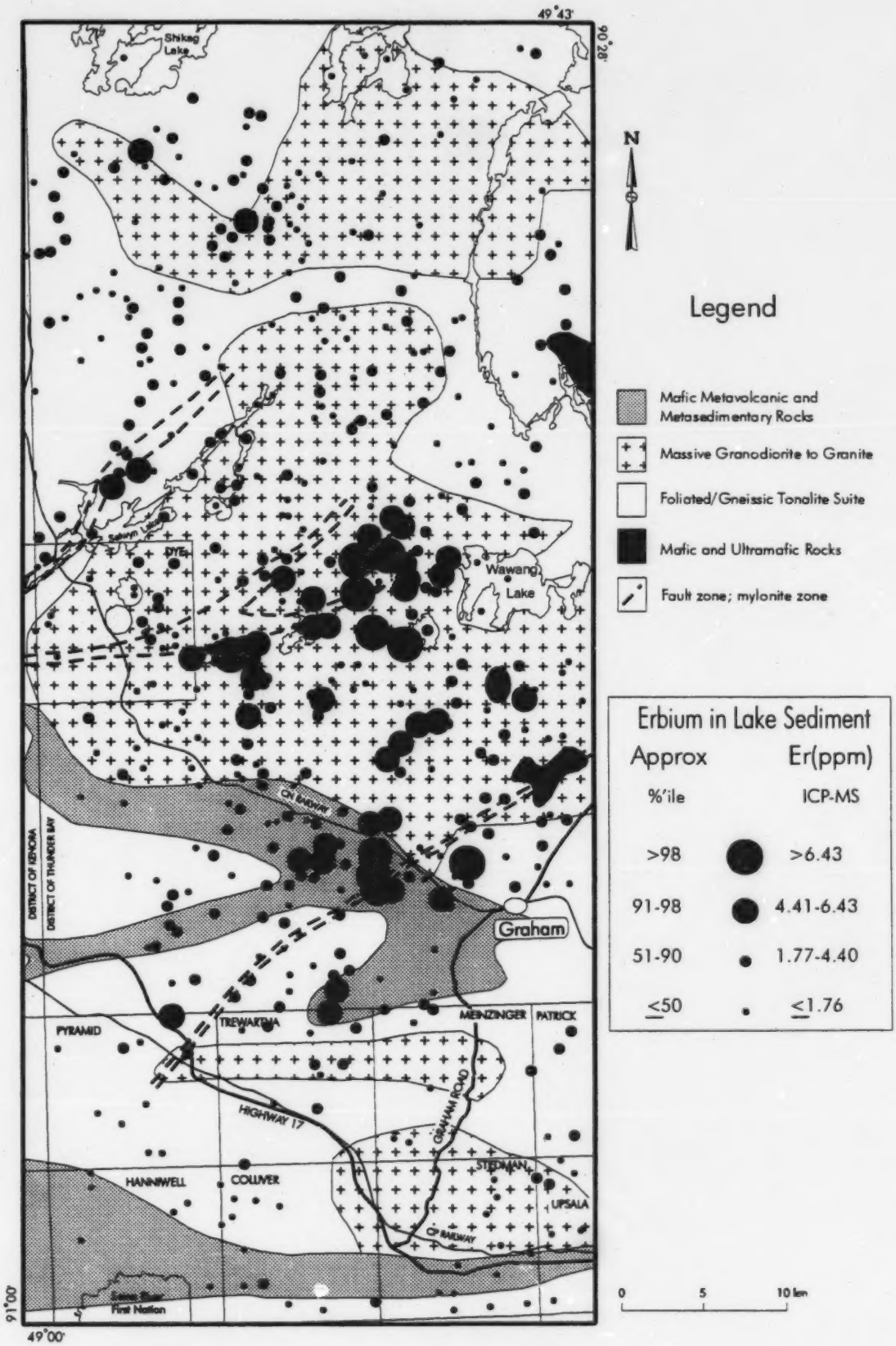
Approx %'ile	Co (ppm) ICP-MS
>98	>37.8
96-98	30.9-37.8
91-95	22.1-30.8
76-90	15.2-22.0
51-75	9.0-15.1
≤50	≤8.9

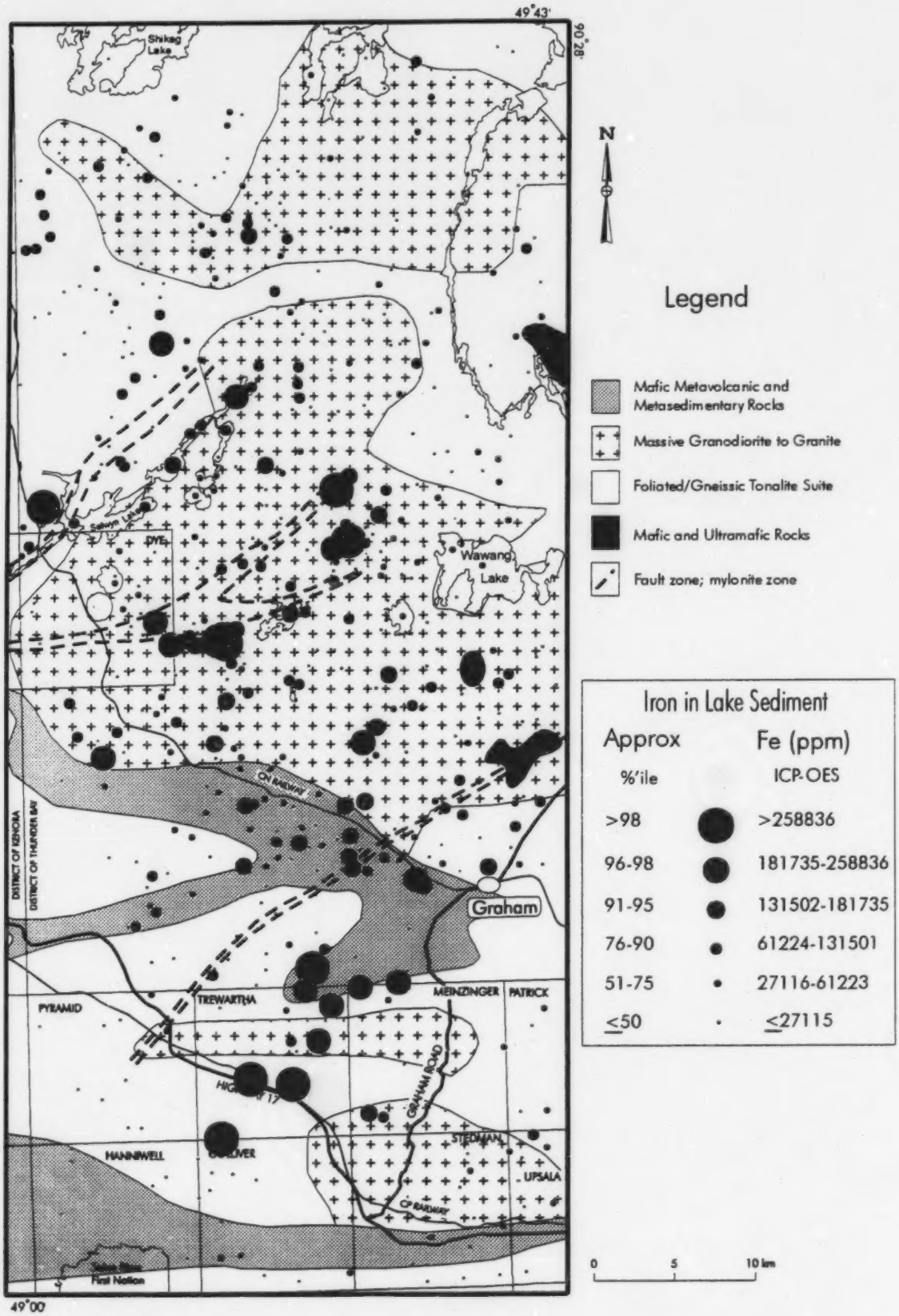

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
CN RAILWAY
Graham
PYRAMID
TREWARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNAWELL
CROLVER
STEDMAN
LIPSALA
CP RAILWAY
91°00'
49°00'
Chromium in Lake Sediment
Approx %'ile
Cr(ppm) ICP-MS
>98 >69
91-98 49-69
51-90 28-48
≤50 ≤27
0 5 10 km

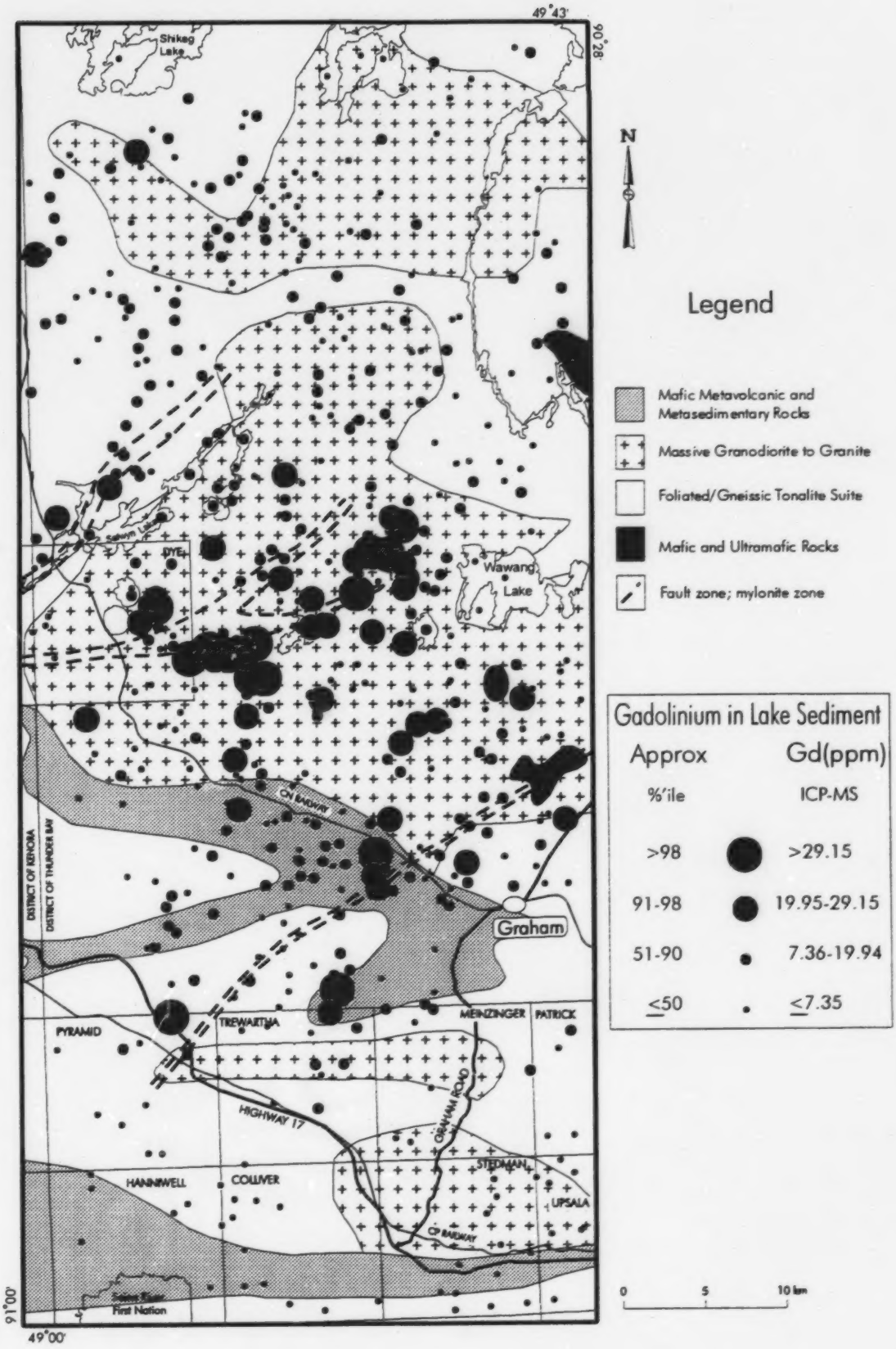

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
91°00'
49°00'
Cesium in Lake Sediment
Approx %'ile
Cs(ppm) ICP-MS
>98 >1.37
91-98 1.10-1.37
51-90 0.74-1.09
≤50 ≤0.73
0 5 10 km

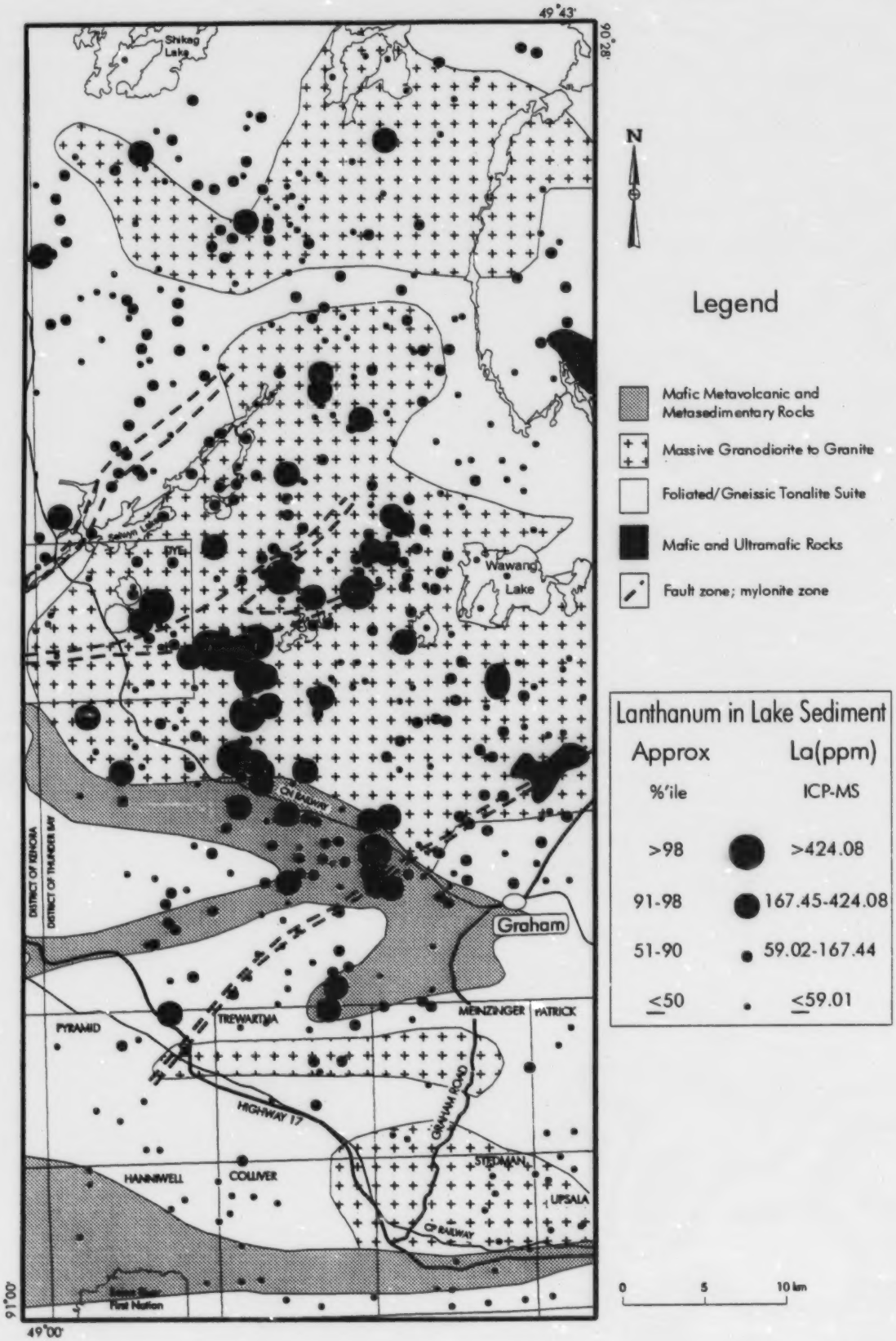

49°43'
90°28'
Shikag Lake
Wawang Lake
DYKE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
STEDMAN
HANNAWELL
COLLVER
UPSALA
CP RAILWAY
Sturgeon River First Nation
91°00'
49°00'
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Copper in Lake Sediment
Approx %'ile
Cu-(ppm) ICP-OES
>98 >59
95-98 47-59
91-95 42-46
76-90 31-41
51-75 24-30
≤50 ≤23
0 5 10 km

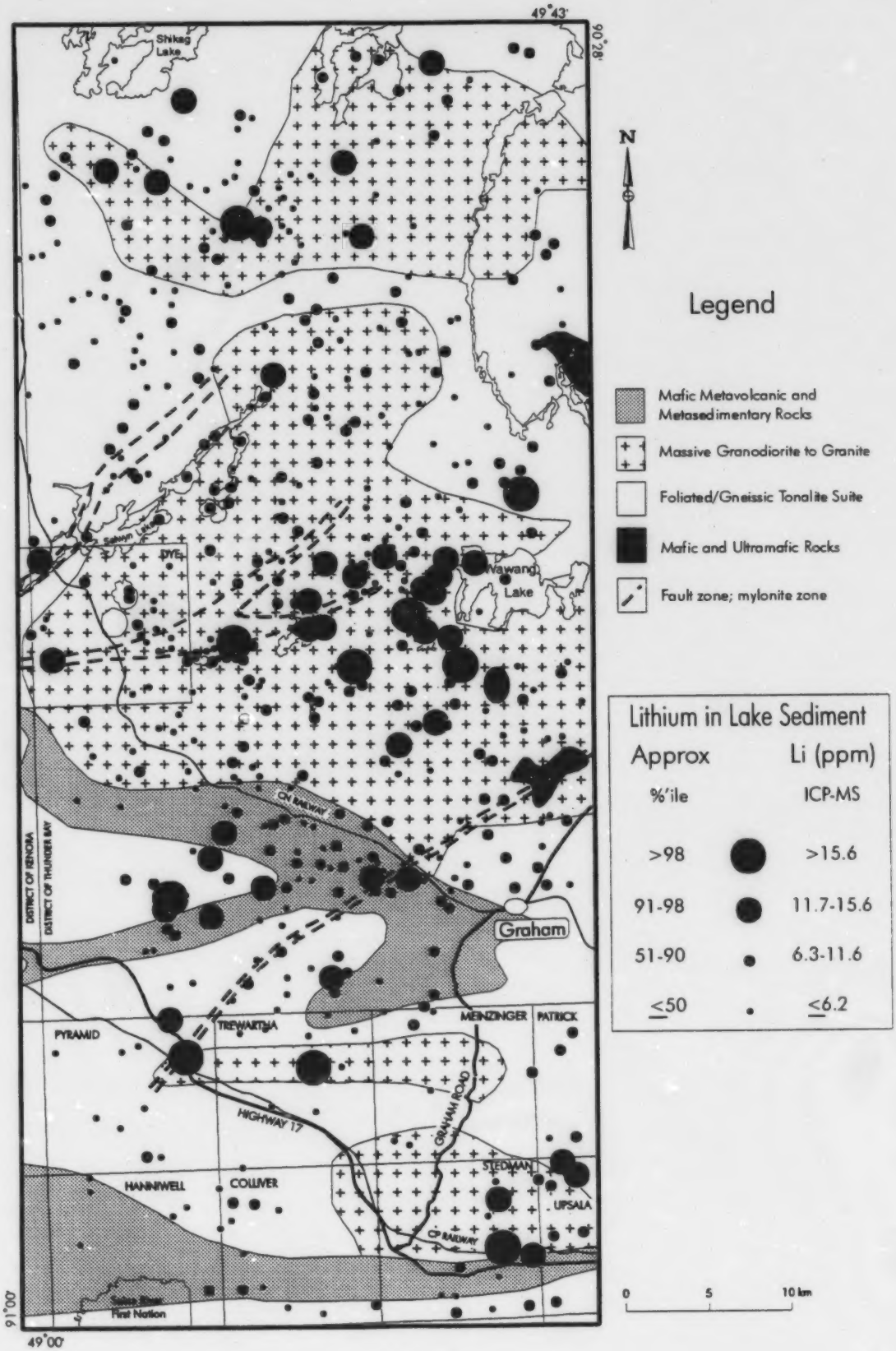

49°43'
90°38'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Dysprosium in Lake Sediment
Approx %'ile
Dy(ppm) ICP-MS
>98 >12.16
91-98 8.40-12.16
51-90 3.50-8.39
≤50 ≤3.49
0 5 10 km
91°00'
49°00'

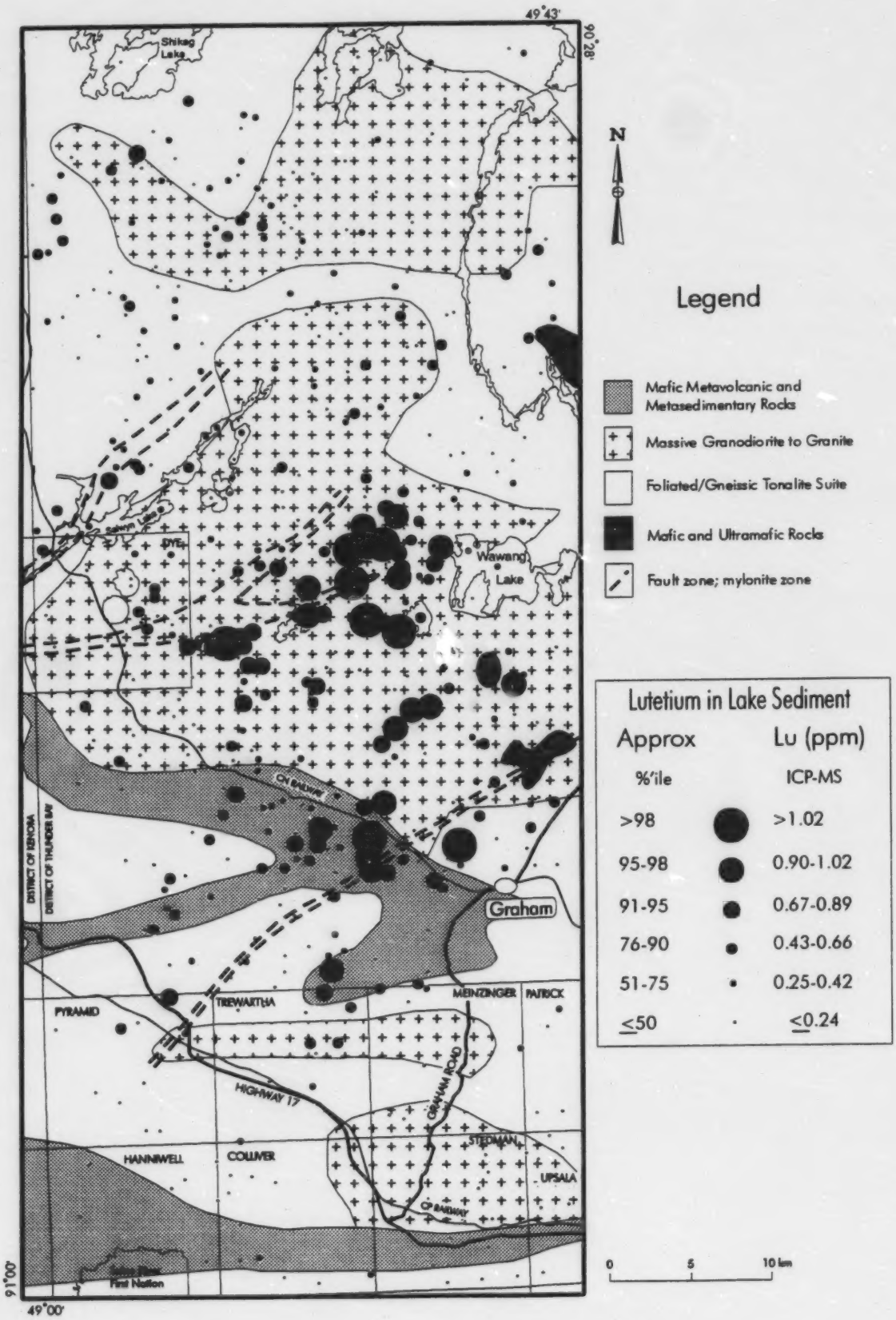

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYER
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNINWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Sandy Lake First Nation
91°00'
49°00'
Erbium in Lake Sediment
Approx %'ile
Er(ppm) ICP-MS
>98 >6.43
91-98 4.41-6.43
51-90 1.77-4.40
≤50 ≤1.76
0 5 10 km

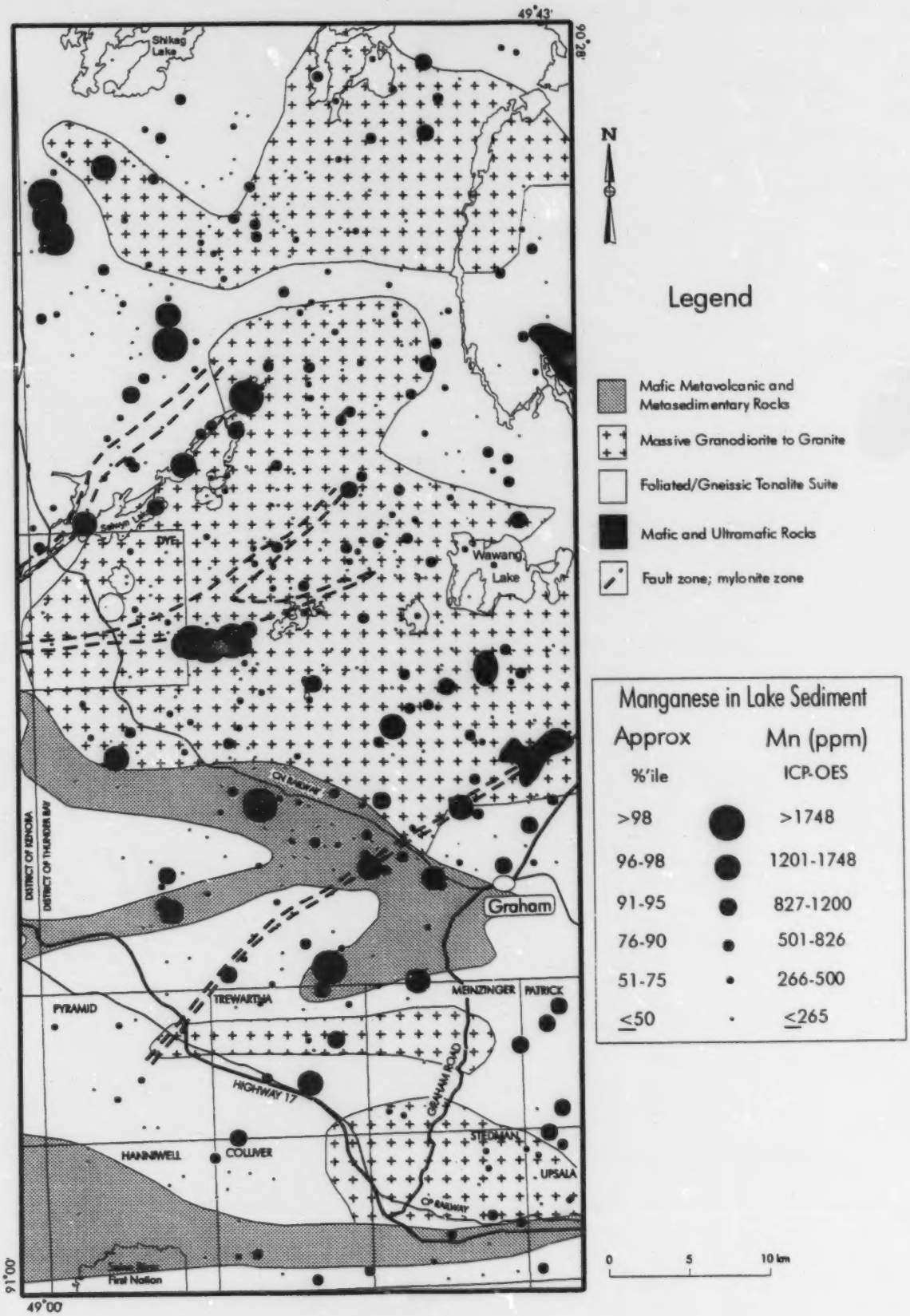

49°43'
90°28'
Shikag Lake
Wawang Lake
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HANNINWELL
STEDMAN
UPSALA
CN RAILWAY
GRAHAM ROAD
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
49°00'
91°00'
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Iron in Lake Sediment
Approx %'ile
Fe (ppm) ICP-OES
>98 >258836
96-98 181735-258836
91-95 131502-181735
76-90 61224-131501
51-75 27116-61223
≤50 ≤27115
0 5 10 km

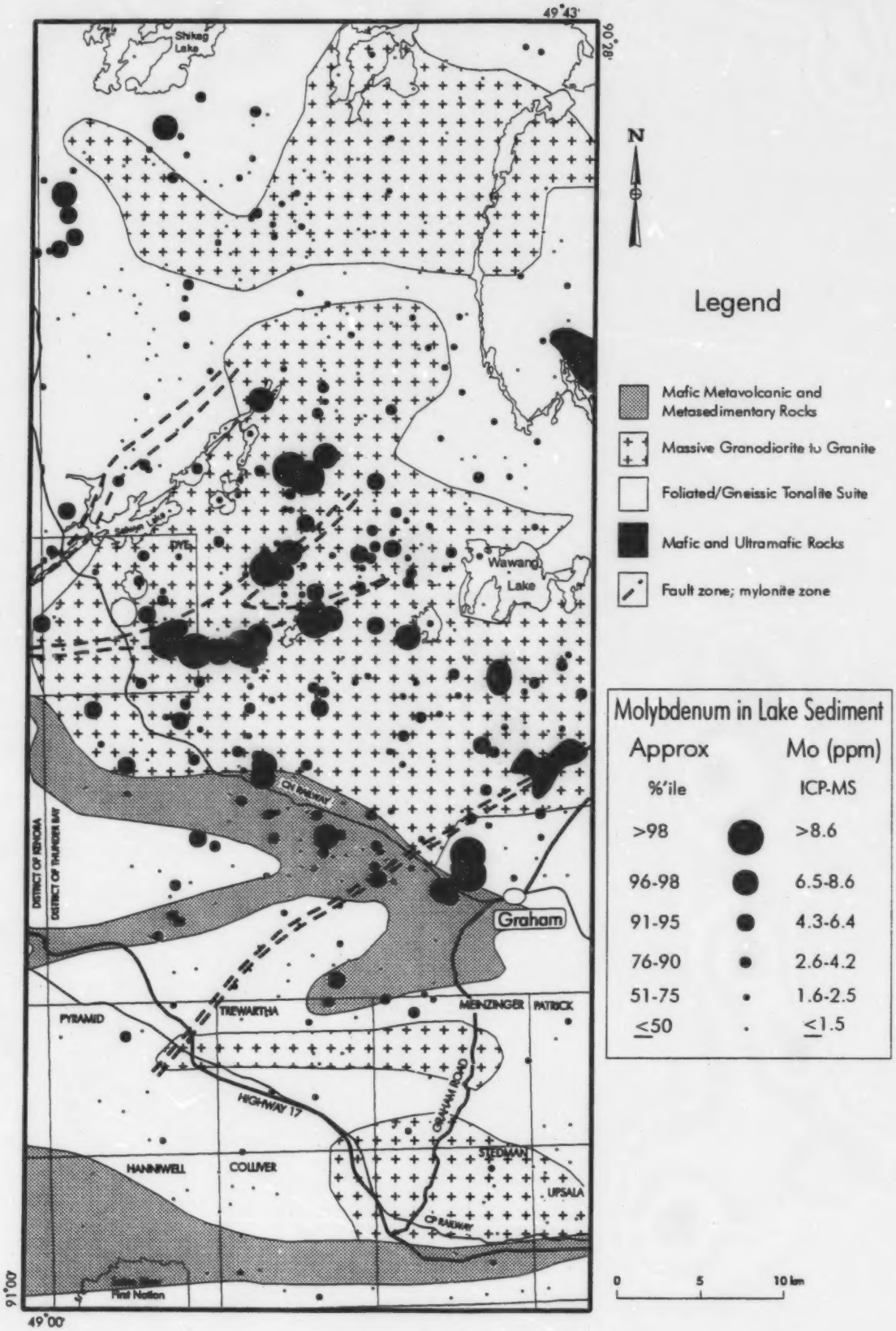

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
STEDMAN
HANNIWELL
COLLVER
UPSALA
CP RAILWAY
Sabaskong First Nation
91°00'
49°00'
Gadolinium in Lake Sediment
Approx %'ile
Gd(ppm) ICP-MS
>98 >29.15
91-98 19.95-29.15
51-90 7.36-19.94
≤50 ≤7.35
0 5 10 km

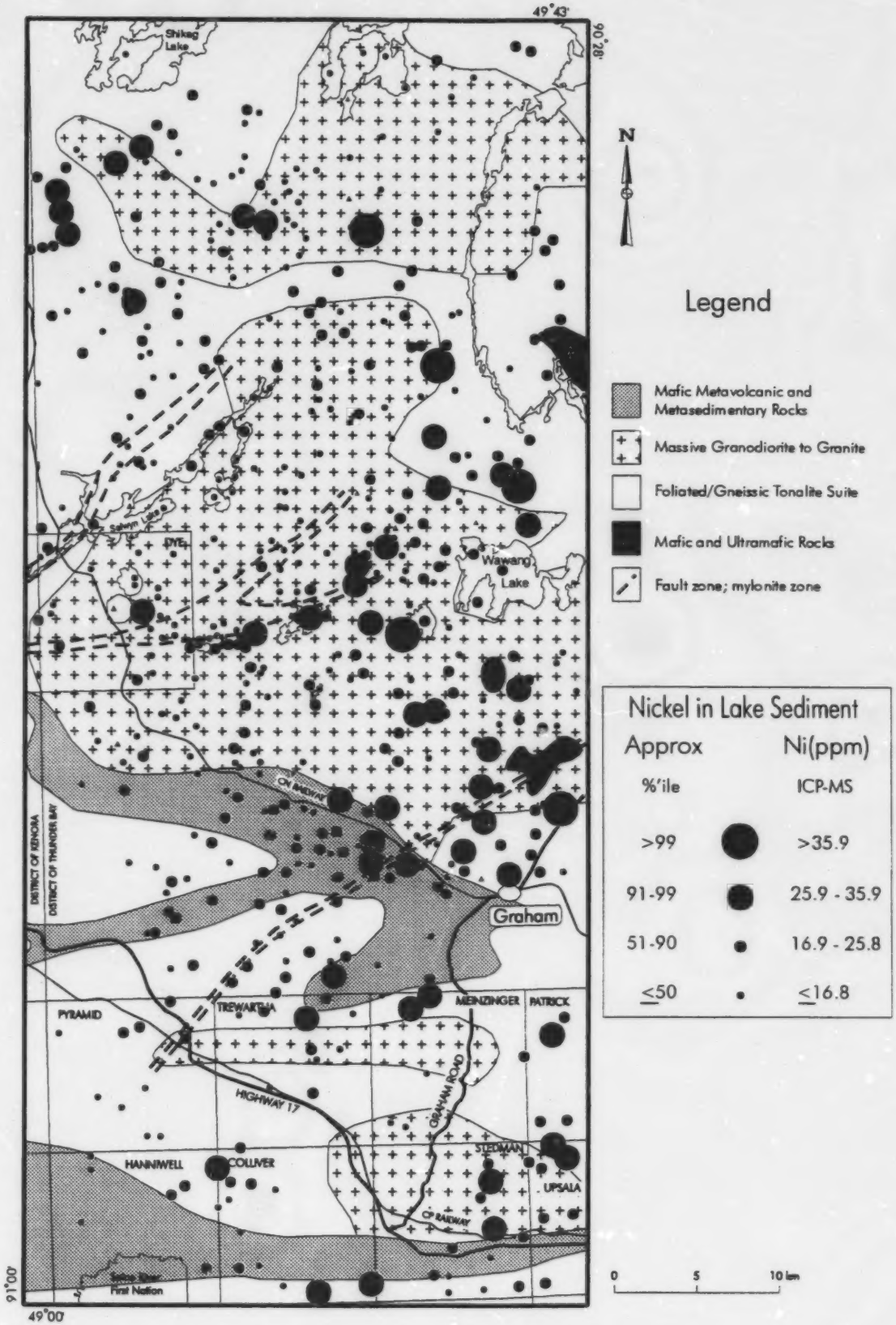

49°43'
90°28'
Shikag Lake
Wawang Lake
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLVER
STEDMAN
UPSALA
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
91°00'
49°00'
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Lanthanum in Lake Sediment
Approx %'ile
La(ppm) ICP-MS
>98 >424.08
91-98 167.45-424.08
51-90 59.02-167.44
≤50 ≤59.01
0 5 10 km

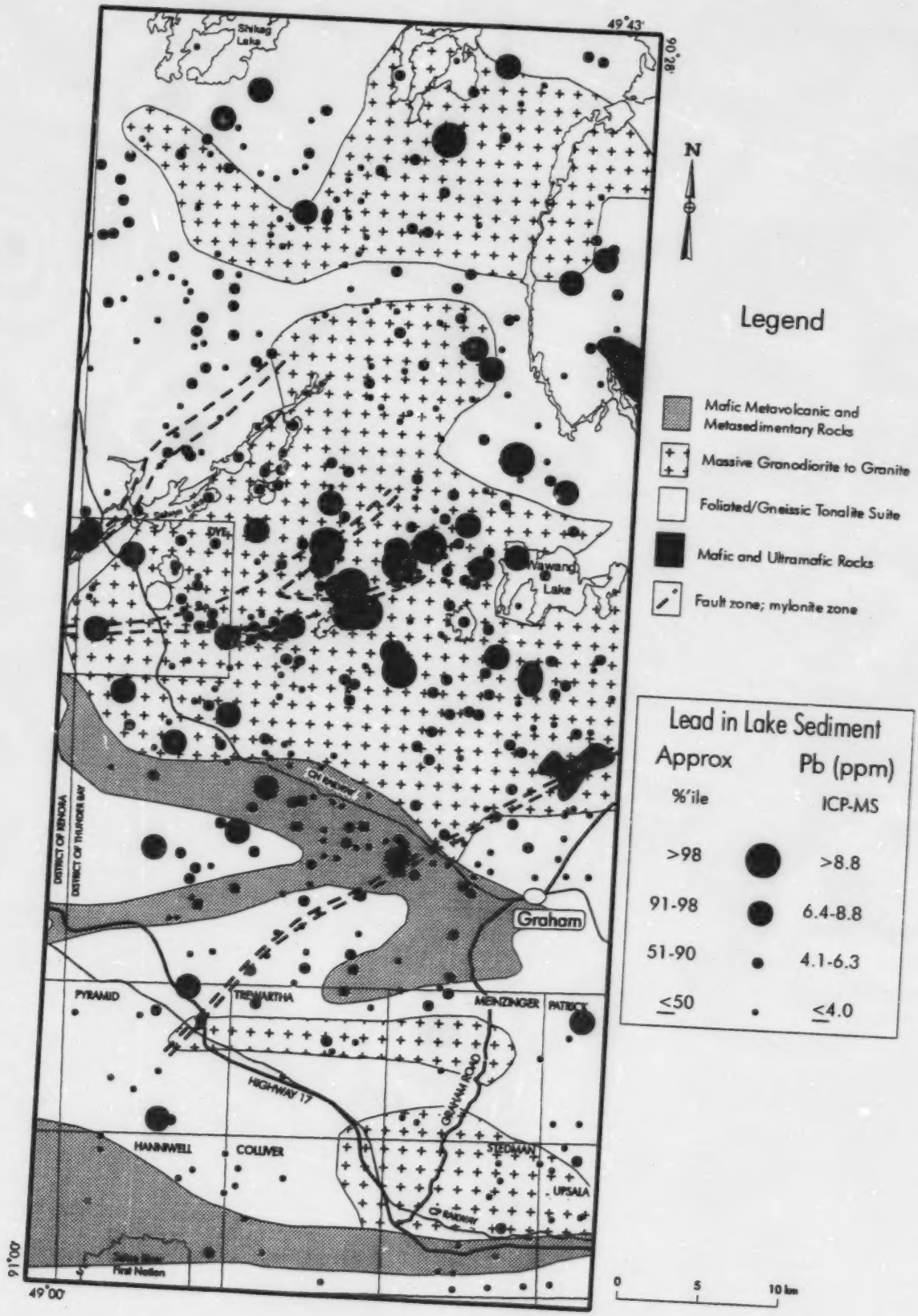

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Sabaskong First Nation
91°00'
49°00'
Lithium in Lake Sediment
Approx %'ile
Li (ppm) ICP-MS
>98 >15.6
91-98 11.7-15.6
51-90 6.3-11.6
≤50 ≤6.2
0 5 10 km

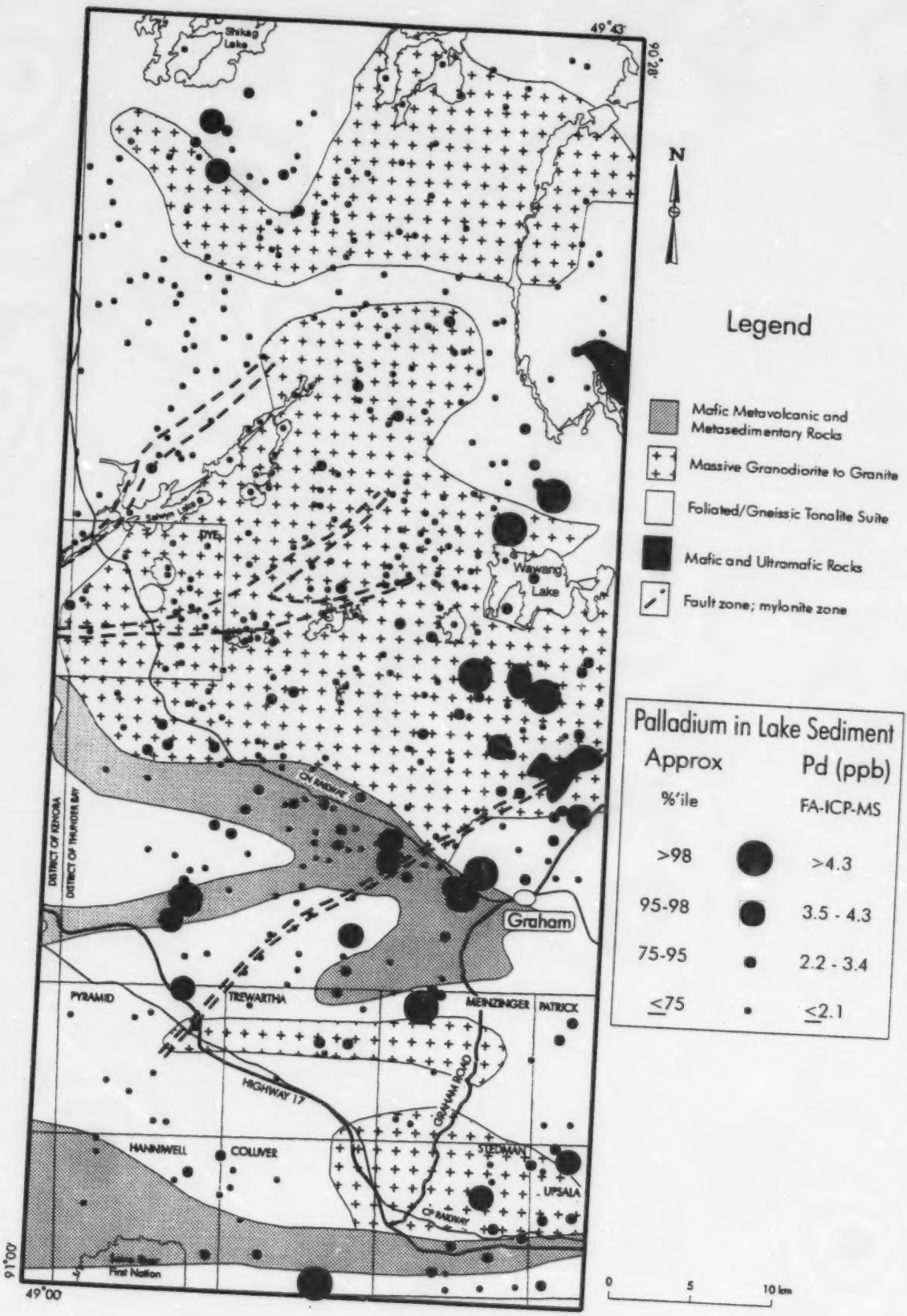

49°43'
90°28'
Shikag Lake
Wawang Lake
DYE
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNINWELL
COLLVER
STEDMAN
UPSALA
CP RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
91°00'
49°00'
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Lutetium in Lake Sediment
Approx %'ile
Lu (ppm) ICP-MS
>98 >1.02
95-98 0.90-1.02
91-95 0.67-0.89
76-90 0.43-0.66
51-75 0.25-0.42
≤50 ≤0.24
0 5 10 km

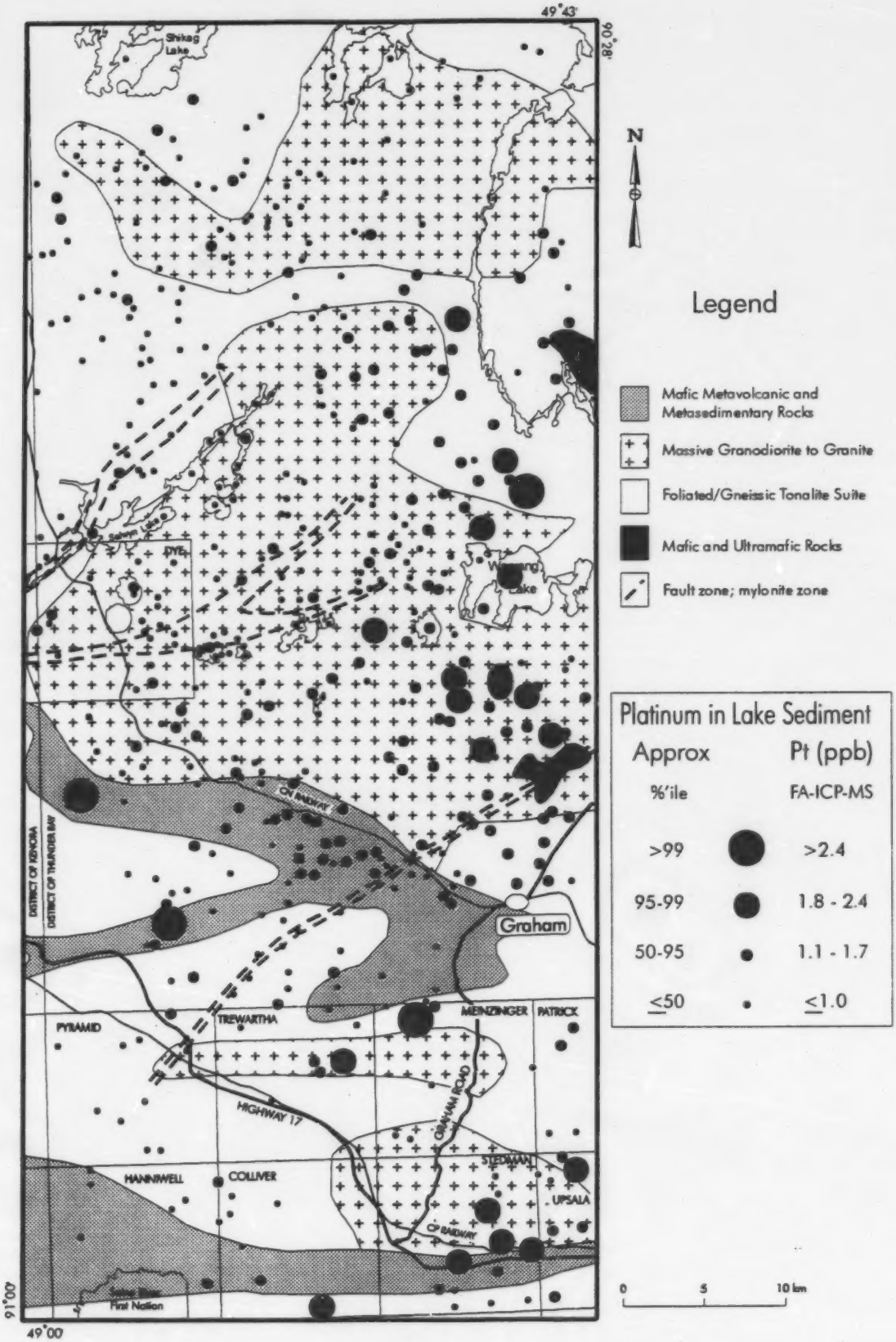

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNINWELL
COLLVER
STEDMAN
UPSALA
CP RAILWAY
Manganese in Lake Sediment
Approx %'ile
Mn (ppm) ICP-OES
>98 >1748
96-98 1201-1748
91-95 827-1200
76-90 501-826
51-75 266-500
≤50 ≤265
0 5 10 km
91°00'
49°00'

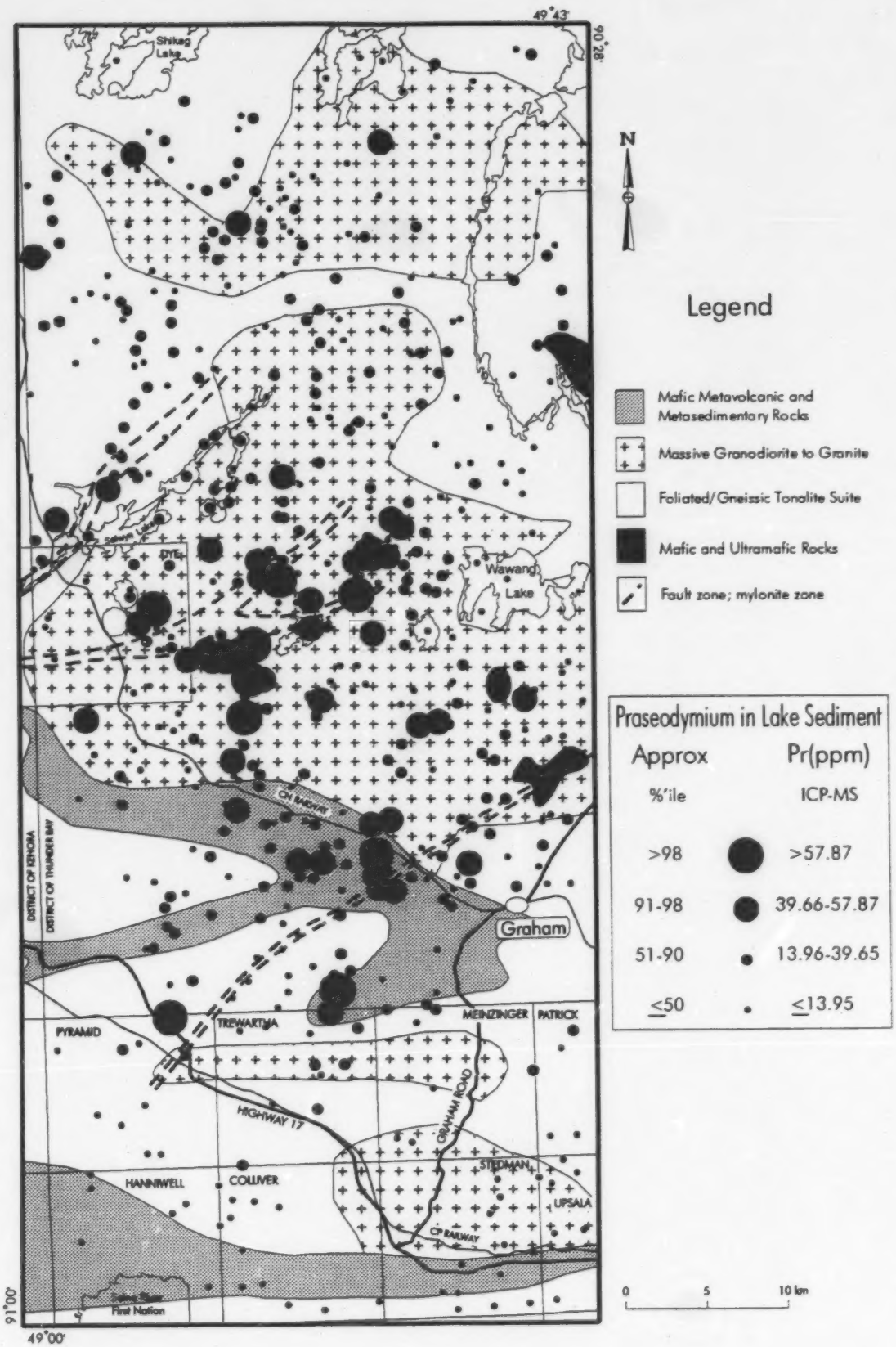

49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
Molybdenum in Lake Sediment
Approx %'ile
Mo (ppm) ICP-MS
>98 >8.6
96-98 6.5-8.6
91-95 4.3-6.4
76-90 2.6-4.2
51-75 1.6-2.5
≤50 ≤1.5
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
CN RAILWAY
Graham
PYRAMID
TREWARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNAHWELL
COLLVER
STEDMAN
UPSALA
CP RAILWAY
First Nation
91°00'
49°00'
0 5 10 km

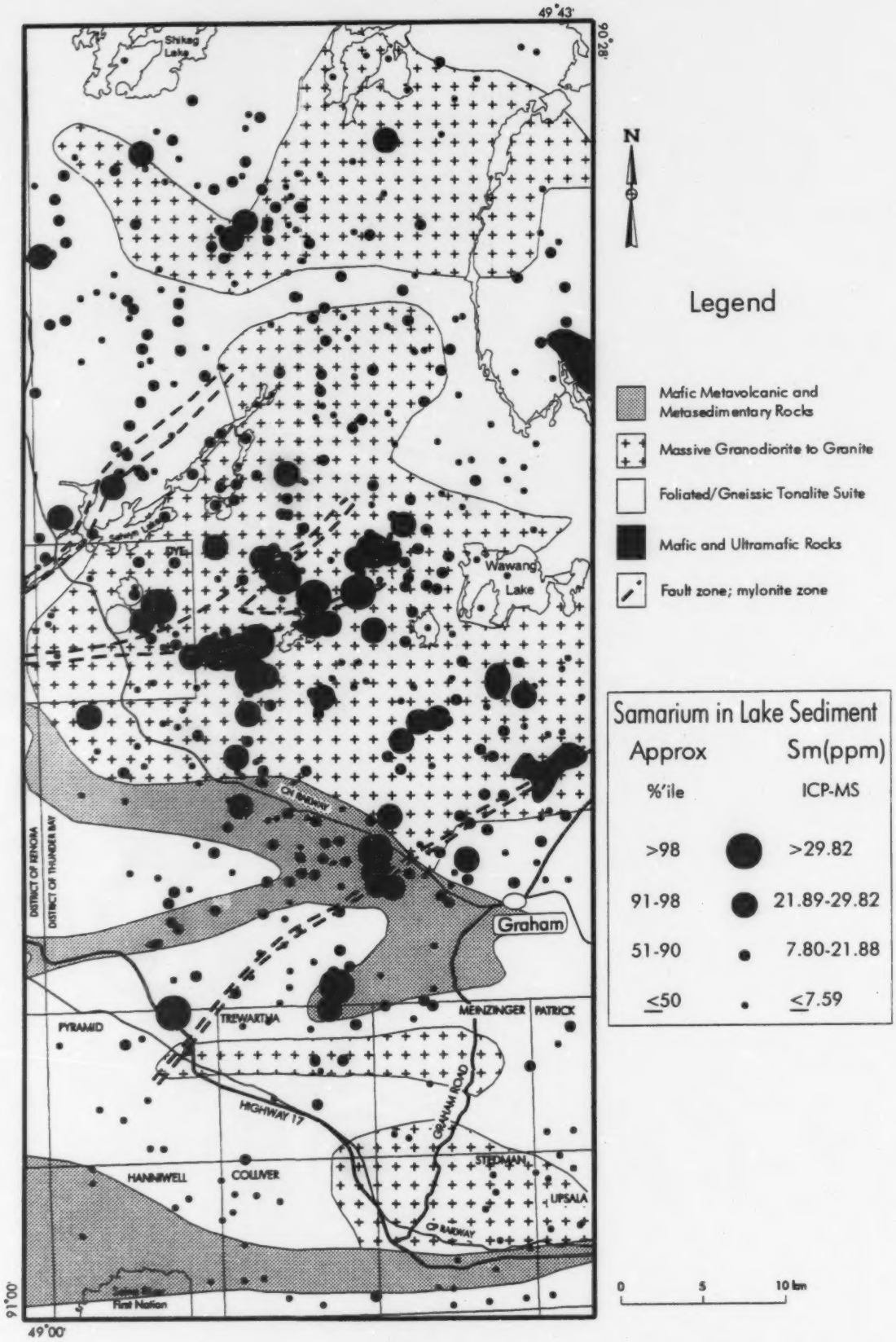

49°43'
90°28'
91°00'
49°00'
Shikag Lake
Wawang Lake
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Sakimay First Nation
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Nickel in Lake Sediment
Approx %'ile
Ni(ppm) ICP-MS
>99 >35.9
91-99 25.9 - 35.9
51-90 16.9 - 25.8
≤50 ≤16.8
0 5 10 km


49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wayland Lake
DYKE
Lead in Lake Sediment
Approx %'ile
Pb (ppm) ICP-MS
>98
>8.8
91-98
6.4-8.8
51-90
4.1-6.3
≤50
≤4.0
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
CP RAILWAY
Graham
PYRAMID
TREMARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLVER
STEDMAN
UPSALA
CP RAILWAY
Sturgeon River First Nation
49°00'
90°16'
0
5
10 km


49°45'
90°38'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Sturgeon River First Nation
91°00'
49°00'
Palladium in Lake Sediment
Approx %'ile
Pd (ppb) FA-ICP-MS
>98 >4.3
95-98 3.5 - 4.3
75-95 2.2 - 3.4
≤75 ≤2.1
0 5 10 km


49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Platinum in Lake Sediment
Approx %'ile
Pt (ppb) FA-ICP-MS
>99 >2.4
95-99 1.8 - 2.4
50-95 1.1 - 1.7
≤50 ≤1.0
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MENZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNAHWELL
COLLVER
STEDMAN
UPSALA
CN RAILWAY
Long Lake First Nation
91°00'16
49°00
0 5 10 km


49°43'
90°28'
91°00'
49°00'
Shikag Lake
Wawang Lake
ON HIGHWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNAHWELL
COLLVER
STEDMAN
UPSALA
CP RAILWAY
First Nation
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Praseodymium in Lake Sediment
Approx %'ile
Pr(ppm) ICP-MS
>98 >57.87
91-98 39.66-57.87
51-90 13.96-39.65
≤50 ≤13.95
0 5 10 km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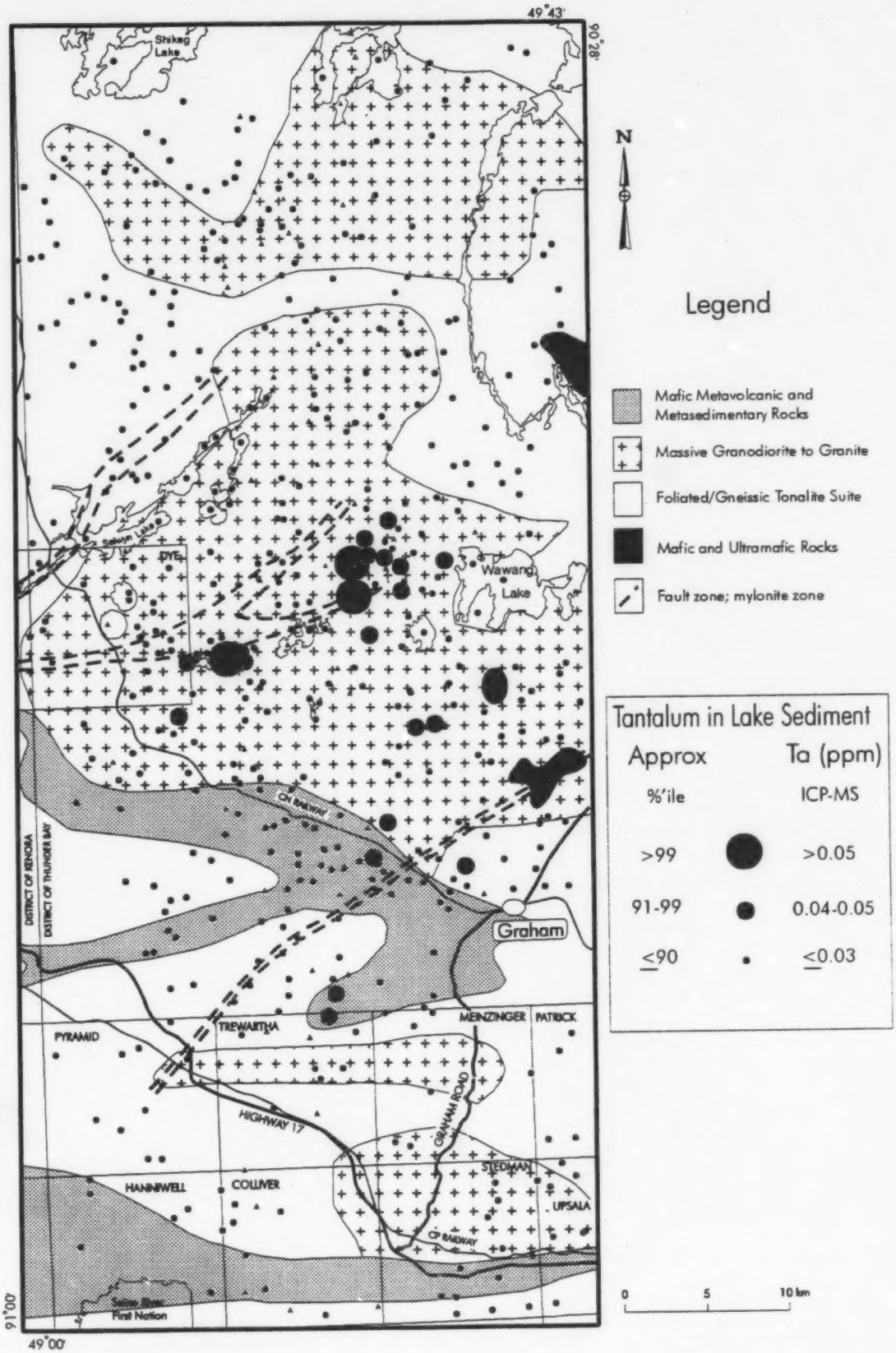
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNAHWELL
COLLIVER
STEDMAN
LIPSALA
CP RAILWAY
Sabaskong First Nation
91°00'
49°00'
Samarium in Lake Sediment
Approx %'ile
Sm(ppm) ICP-MS
>98 >29.82
91-98 21.89-29.82
51-90 7.80-21.88
≤50 ≤7.59
0 5 10 km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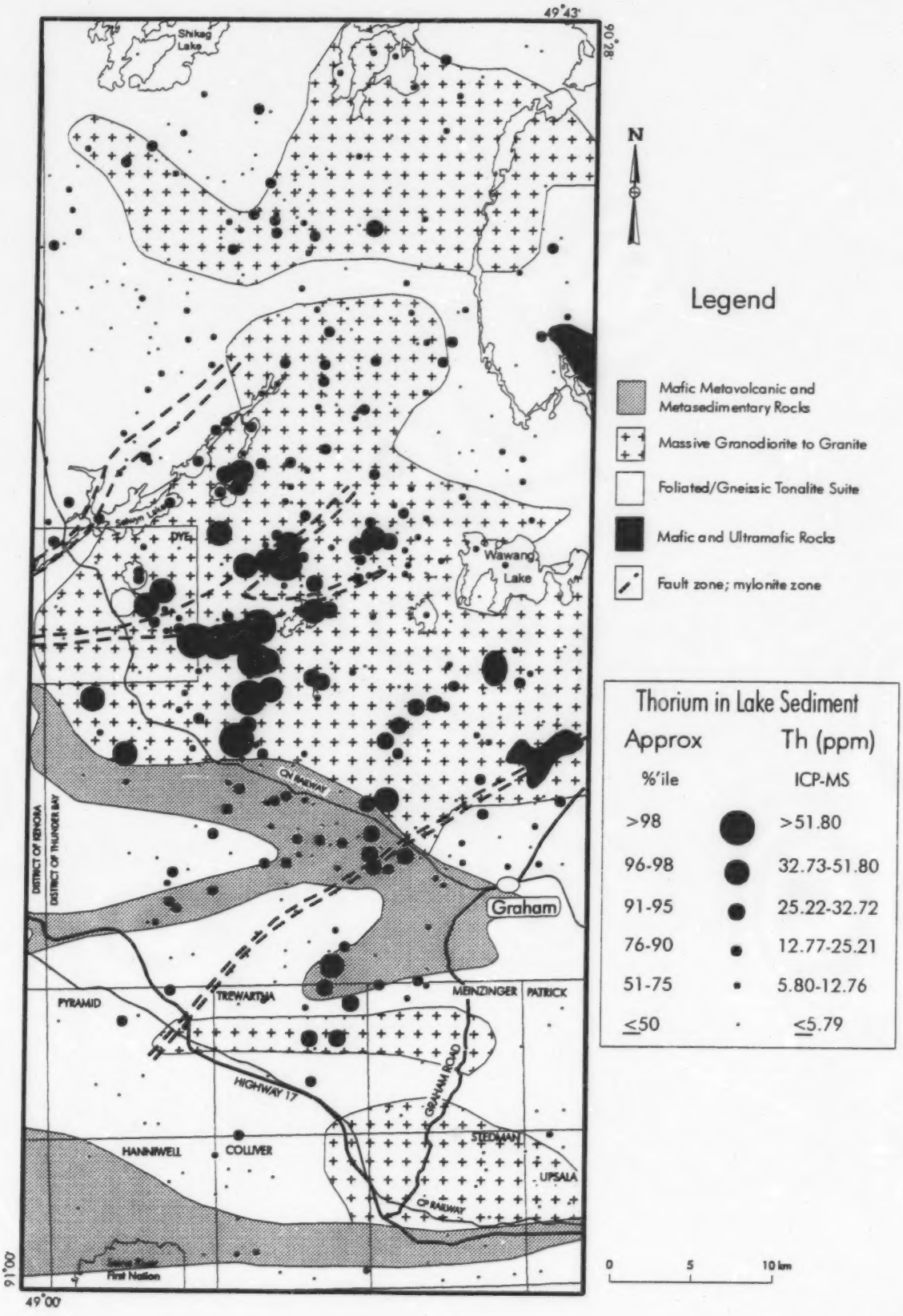
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
Graham
TREWARTHA
MEINZINGER
PATRICK
PYRAMID
HIGHWAY 17
GRAHAM ROAD
HANBIDWELL
COLLIVER
STEDMAN
UPSALA
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Tantalum in Lake Sediment
Approx %'ile
Ta (ppm) ICP-MS
>99 >0.05
91-99 0.04-0.05
≤90 ≤0.03
0 5 10 km
91°00'
49°00'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90°28'
Shikag Lake
N
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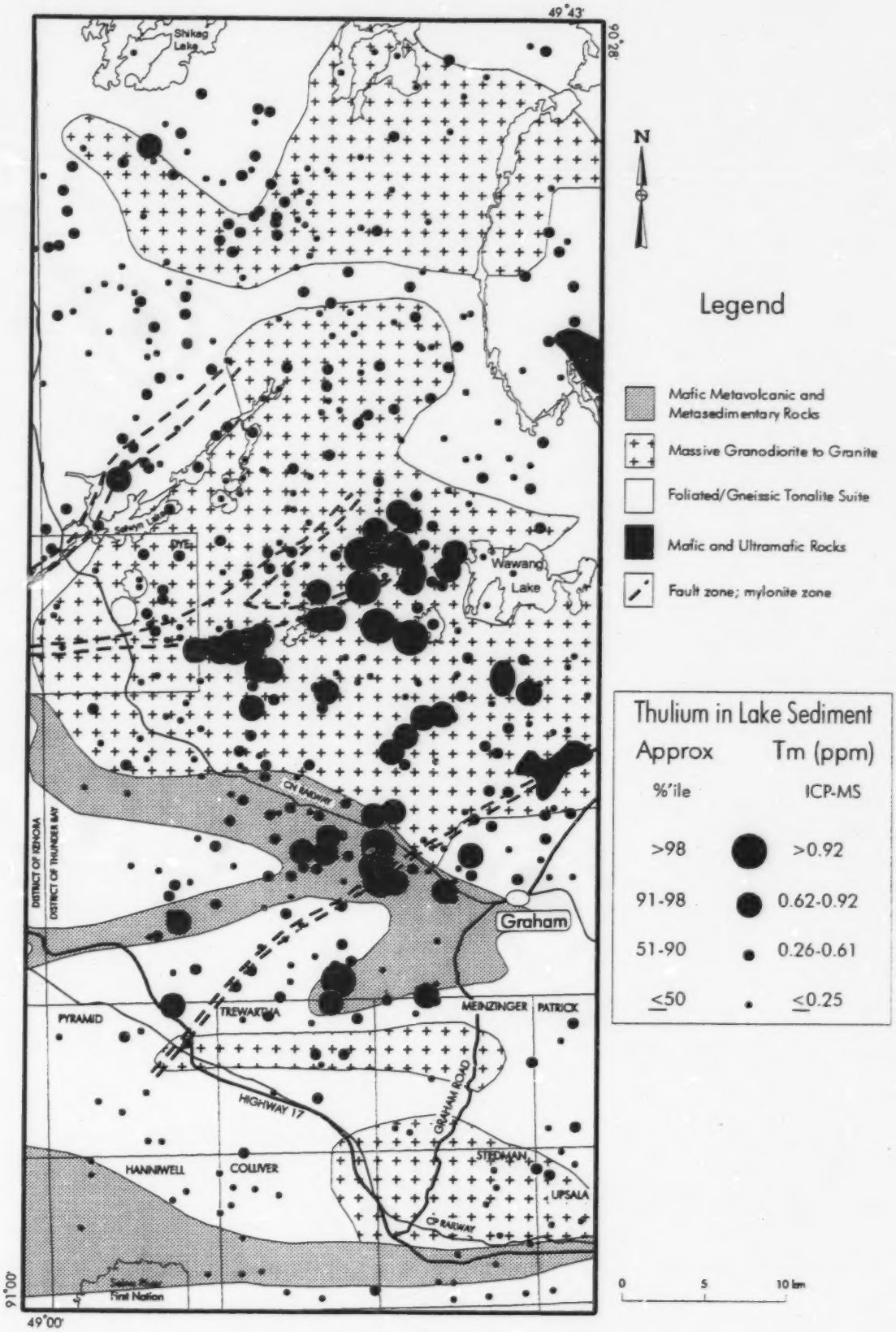
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNINWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Thorium in Lake Sediment
Approx %'ile
Th (ppm) ICP-MS
>98 >51.80
96-98 32.73-51.80
91-95 25.22-32.72
76-90 12.77-25.21
51-75 5.80-12.76
≤50 ≤5.79
0 5 10 km
91°00'
49°00'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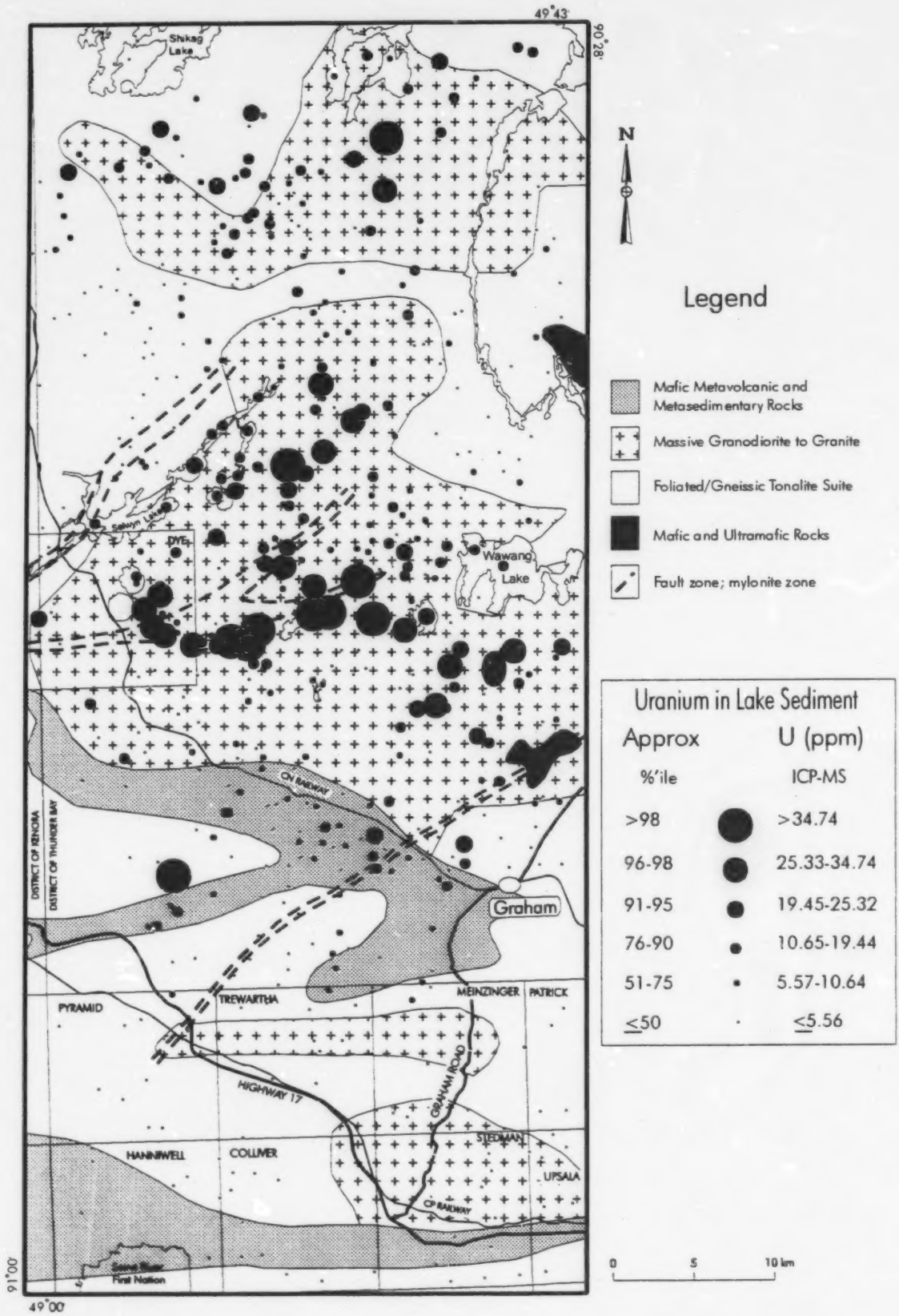
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN MAINLINE
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNIWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Thulium in Lake Sediment
Approx %'ile
Tm (ppm) ICP-MS
>98 >0.92
91-98 0.62-0.92
51-90 0.26-0.61
≤50 ≤0.25
0 5 10 km
91°00'
49°00'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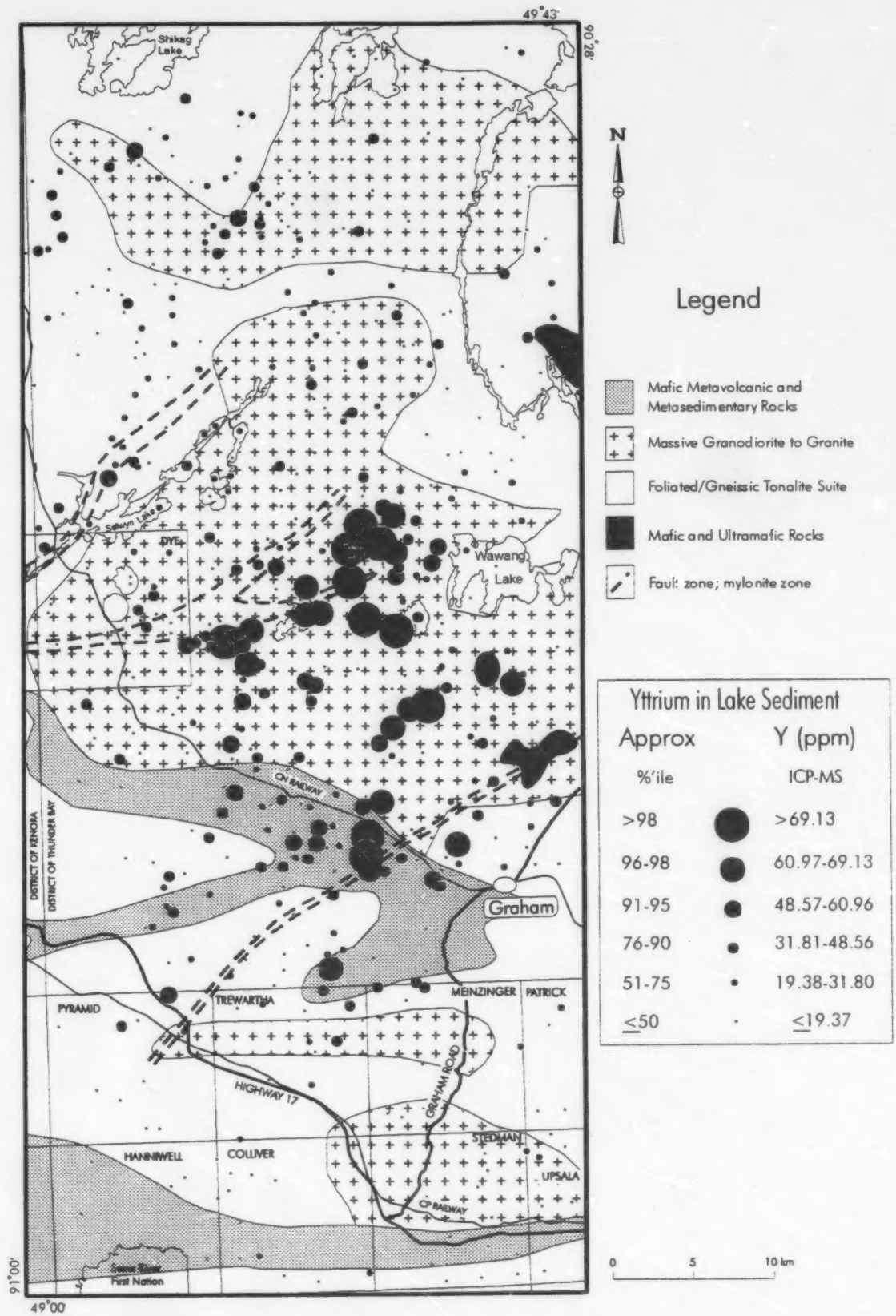
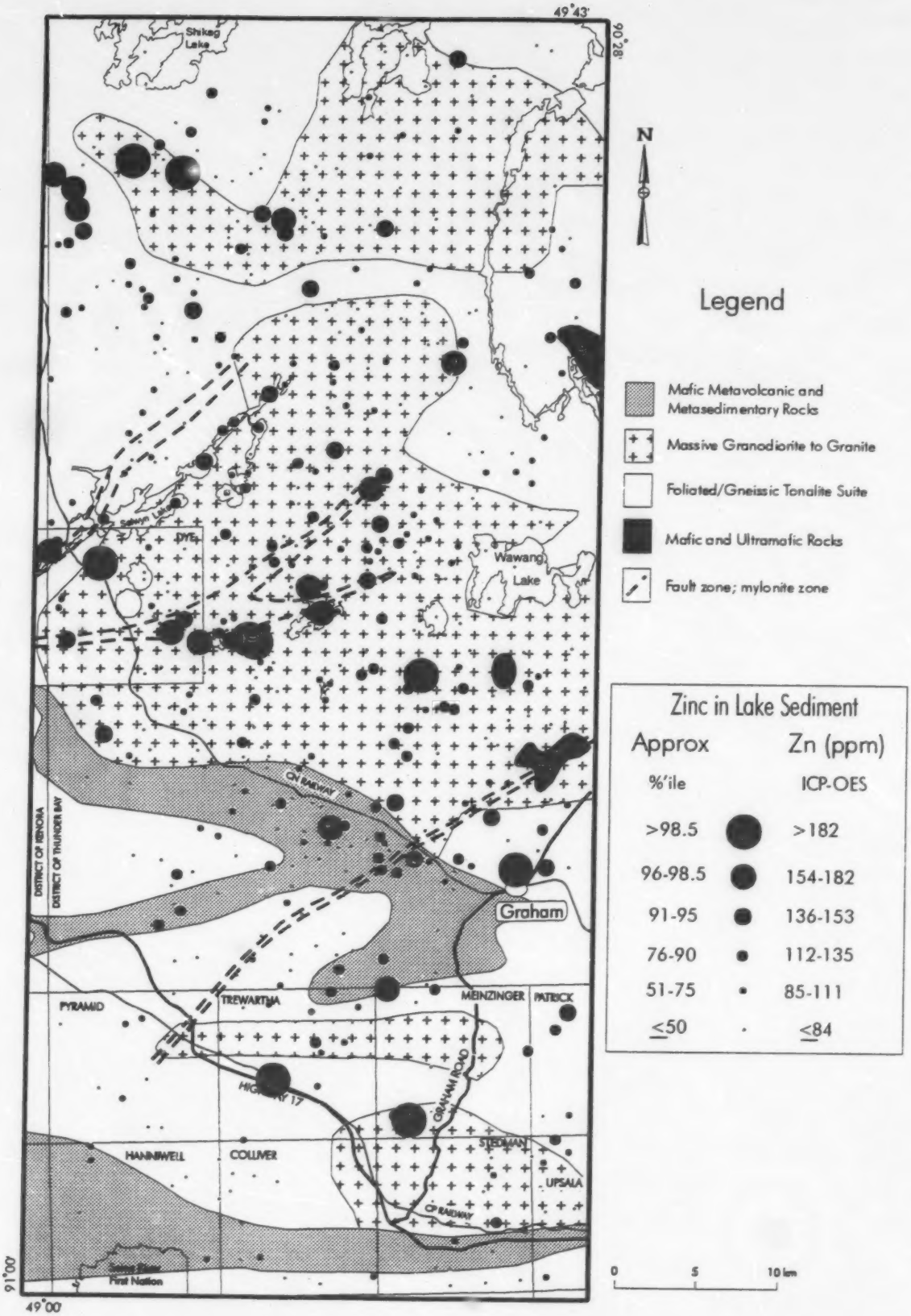
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
STEDMAN
HANNIWELL
COLLVER
UPSALA
CP RAILWAY
Uranium in Lake Sediment
Approx %'ile
U (ppm) ICP-MS
>98 >34.74
96-98 25.33-34.74
91-95 19.45-25.32
76-90 10.65-19.44
51-75 5.57-10.64
≤50 ≤5.56
0 5 10 km
91°00'
49°00'


49°43'
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault: zone; mylonite zone
Sewell Lake
DYE
Wawang Lake
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
HANNINWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Sandy Bay First Nation
91°00'
49°00'
Yttrium in Lake Sediment
Approx %'ile
Y (ppm) ICP-MS
>98 >69.13
96-98 60.97-69.13
91-95 48.57-60.96
76-90 31.81-48.56
51-75 19.38-31.80
≤50 ≤19.37
0 5 10 km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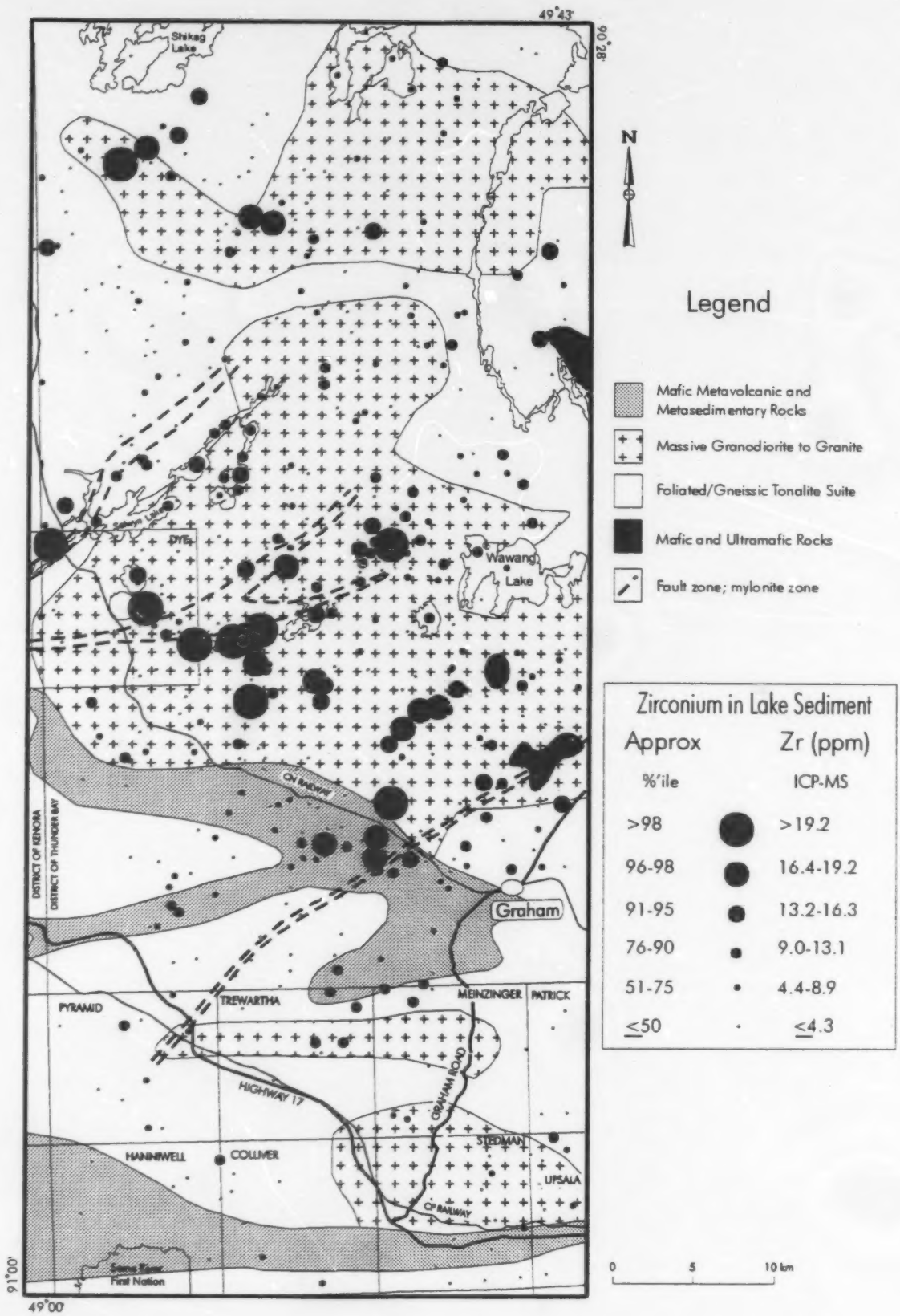
90°28'
Shikag Lake
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Wawang Lake
DYE
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
GRAHAM ROAD
HANNAHWELL
COLLIVER
STEDMAN
UPSALA
CP RAILWAY
Sandy River First Nation
91°00'
49°00'
Zinc in Lake Sediment
Approx %'ile
Zn (ppm) ICP-OES
>98.5 >182
96-98.5 154-182
91-95 136-153
76-90 112-135
51-75 85-111
≤50 ≤84
0 5 10 km


49°43'
90°28'
Shikag Lake
Sawyn Lake
DYE
Wawang Lake
CN RAILWAY
DISTRICT OF KENORA
DISTRICT OF THUNDER BAY
Graham
PYRAMID
TREWARTHA
MEINZINGER
PATRICK
HIGHWAY 17
GRAHAM ROAD
CP RAILWAY
HANNIWELL
COLLVER
STEDMAN
UPSALA
Sabaskong First Nation
91°00'
49°00'
N
Legend
Mafic Metavolcanic and Metasedimentary Rocks
Massive Granodiorite to Granite
Foliated/Gneissic Tonalite Suite
Mafic and Ultramafic Rocks
Fault zone; mylonite zone
Zirconium in Lake Sediment
Approx %'ile
Zr (ppm) ICP-MS
>98 >19.2
96-98 16.4-19.2
91-95 13.2-16.3
76-90 9.0-13.1
51-75 4.4-8.9
≤50 ≤4.3
0 5 10 km

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Appendix B

ANALYTICAL DATA

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav	INAA	INAA	FAICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FAICPMS	FAICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
977	677700	5484350	3.0	25.1	2.1	1	INF	29	25	39711	0.5	19.1	3.7	INF	INF	93.9	3.09	106	0.5
978	678450	5485800	2.0	43.7	2.6	1	INF	27	33	15000	1.8	21.5	2.9	INF	INF	122.2	2.6	91	0.5
1000	678342	5480486	7.6	38.9	3.6	1	INF	38	47	44924	1.7	32.6	5.3	INF	INF	88.7	8.48	82	11.8
1002	674018	5481935	5.4	56.4	3	9	1.5	18	20	35436	1.0	12.5	4.5	1.2	1.3	115.5	2.39	70	7.7
1003	674833	5483577	6.7	43.4	3.6	1	1.5	25	28	20828	3.1	19.2	4.0	1.9	1.3	151.6	7.20	102	4.5
1004	674575	5484850	6.0	52.3	0.25	1	1.5	20	21	18204	0.9	14.4	12.0	0.4	0.9	101.1	1.98	78	2.1
1005	673794	5484707	1.8	58.1	3.5	7	1.5	27	17	20760	1.1	22.3	4.7	1.0	1.3	106.5	1.07	60	6.4
1007	671802	5480549	6.0	37.5	2.9	1	1.5	32	31	35774	1.7	23.0	6.7	1.2	1.4	154.4	8.26	87	6.7
1008	671303	5479380	6.7	41.4	3.1	1	1.5	31	35	42652	1.3	24.3	5.8	0.8	0.8	202.0	10.64	93	9.7
1009	670490	5478550	1.5	40.8	1.6	7	1.5	22	32	18901	2.2	16.6	3.5	0.5	1.0	290.0	19.90	65	4.6
1010	669494	5479094	10.6	52.1	3.9	7	1.5	45	42	64993	4.2	29.4	8.9	1.8	1.5	685.7	15.45	131	21.4
1011	668207	5478550	1.8	53.1	3.3	1	1.5	24	22	36250	3.5	18.7	5.2	1.5	1.2	181.4	5.69	94	12.3
1012	668917	5477466	0.9	38.0	0.25	4	1.5	9	11	9395	0.8	8.5	2.5	0.15	0.9	79.8	4.73	26	2.0
1013	668251	5476941	1.3	32.1	1.2	6	1.5	15	14	13862	1.1	12.5	2.3	0.4	0.8	178.7	6.65	41	2.9
1014	667597	5476750	4.5	46.9	3.3	1	INF	INF	INF	INF	INF	INF	INF	INF	INF	INF	INF	INF	INF
1016	670524	5477053	0.6	52.1	1.8	1	1.5	19	35	30369	3.5	13.4	3.5	0.8	0.4	286.3	19.20	97	5.3
1017	671820	5477108	3.0	26.4	1.2	6	1.5	26	20	16724	0.8	19.4	4.4	0.8	1.4	134.2	4.70	70	3.0
1018	672787	5477876	9.1	29.8	2.5	5	1.5	31	40	43239	1.8	22.8	7.1	1.3	0.9	208.5	11.59	107	9.8
1019	673182	5478902	6.0	31.8	2.1	4	1.5	27	38	18664	2.9	21.3	6.0	1.1	0.5	155.5	16.09	85	4.2
1020	676746	5477652	13.7	20.9	1.6	3	1.5	29	26	27124	0.8	21.0	4.3	2.8	2.0	76.2	12.23	74	5.5
1021	675069	5480653	3.0	58.3	4.5	6	1.5	NM	NM	NM	NM	NM	NM	6.4	1.9	NM	NM	NM	NM
1023	672744	5482784	1.2	50.4	1	1	1.5	23	21	14535	0.9	31.4	3.9	0.7	1.4	104.5	2.86	64	1.6
1024	676734	5483618	1.8	34.3	3.4	1	1.5	25	31	23776	1.8	27.2	4.3	2.6	1.5	73.6	3.49	85	5.3
1025	676450	5484798	3.0	21.5	1.8	1	4	31	29	35832	1.5	24.6	3.7	2.7	2.0	93.0	4.01	84	11.9
1027	679527	5489844	4.2	38.8	1.3	1	1.5	27	24	23649	1.0	21.5	2.8	0.9	1.2	99.5	4.24	97	2.0
1028	678768	5492080	9.7	45.0	3	3	1.5	47	49	46437	2.3	25.3	4.2	2.4	1.7	234.0	5.83	121	13.5
1029	679300	5492250	3.0	8.3	1.5	1	3	24	27	30771	1.3	17.9	3.1	2.6	1.0	100.2	3.68	43	11.0
1030	680347	5493331	1.2	37.7	2.5	1	1.5	27	25	31308	1.4	21.8	3.4	0.8	1.1	177.9	3.15	73	3.2
1032	680270	5495501	3.0	65.7	2.2	4	1.5	30	49	8265	2.3	21.3	4.1	1.9	0.9	180.6	5.31	118	7.3
1033	679388	5497638	5.4	31.9	1.8	1	1.5	38	24	86659	1.5	22.4	6.7	1.5	1.5	260.8	5.93	108	14.6
1034	679871	5498298	1.8	35.3	3	5	1.5	20	15	22260	0.6	20.4	5.3	0.4	1.0	77.3	1.80	78	2.3
1035	678740	5498857	2.7	37.1	2.7	5	1.5	27	21	36115	1.1	22.3	5.2	0.9	1.2	93.8	2.59	111	2.3
1036	677337	5496110	6.7	45.5	2.9	1	1.5	45	34	58126	1.7	24.0	8.1	2.0	1.7	234.3	6.75	129	9.7
1039	673578	5493580	3.0	62.9	2.4	1	1.5	19	16	20357	1.9	14.6	5.0	0.5	2.1	80.4	2.08	35	4.6
1040	674018	5493739	1.5	11.2	1	4	1.5	21	16	36518	1.1	13.5	2.1	0.5	0.7	113.9	3.48	59	8.2
1041	673245	5491707	4.2	34.3	2	1	1.5	35	36	46201	1.9	22.3	3.8	1.7	1.4	265.4	8.42	121	9.6
1042	677199	5490254	11.5	65.4	1.4	4	1.5	19	20	10091	0.9	15.8	3.4	0.3	0.9	37.0	0.78	62	2.1
1044	677751	5482911	5.7	25.6	2.1	1	1.5	57	46	35315	1.2	41.1	6.4	4.8	2.9	128.5	6.08	103	13.0
1045	675752	5487048	6.0	42.7	1.9	1	1.5	17	16	11748	1.8	14.0	3.7	2.3	1.2	60.9	3.86	73	1.9
1046	673770	5488886	4.5	39.4	2.2	6	1.5	20	25	15724	2.1	16.8	3.1	1.0	1.1	84.5	2.17	69	1.7
1048	672698	5490427	5.7	37.8	2.2	1	1.5	48	28	63876	1.9	38.1	8.7	1.3	1.5	276.0	4.36	154	8.0
1049	671654	5491662	1.5	51.1	2.8	8	1.5	23	20	19989	2.3	24.6	6.8	1.4	1.1	127.3	2.95	63	7.4
1050	671069	5491579	0.9	35.0	1.6	1	1.5	16	22	9041	1.0	20.1	4.7	1.0	1.2	121.2	3.20	47	1.3
1051	670656	5493536	8.2	39.3	2.2	1	1.5	24	40	20281	1.9	20.5	5.9	2.2	1.4	266.5	12.74	73	6.7
1052	669343	5493187	1.8	45.9	1.8	1	1.5	16	14	18466	1.2	13.6	2.9	1.0	1.2	76.2	3.06	75	1.4
1053	670307	5495409	5.7	32.8	1.2	1	1.5	30	25	37672	1.3	22.0	4.3	0.9	1.1	214.9	8.30	95	7.0
1055	671083	5496335	1.5	64.4	2	1	1.5	19	25	5331	1.2	20.0	6.0	1.3	1.6	111.9	11.14	96	2.8
1056	671400	5499448	0.9	24.2	1.6	1	1.5	20	16	19044	0.8	18.0	3.7	0.7	0.8	169.5	8.57	63	6.3
1057	668248	5498840	2.4	38.3	2.3	5	1.5	49	31	47465	1.1	36.0	5.5	1.9	1.4	301.8	13.45	148	16.1
1058	666483	5496281	4.8	40.1	1.7	1	1.5	28	24	20398	1.2	20.3	4.8	0.8	1.0	206.4	9.21	94	2.0
1059	666639	5493762	1.5	43.4	1.1	1	1.5	13	14	4904	0.6	13.1	3.0	0.6	1.0	45.5	1.77	36	1.2
1060	666907	5492457	6.7	40.8	1.9	1	1.5	29	28	17820	1.7	25.5	4.4	1.9	1.4	128.4	6.08	110	2.2
1061	667334	5490050	1.5	49.5	2.6	1	1.5	9	8	12041	0.6	8.4	1.6	0.7	1.2	49.1	2.41	13	2.8
1062	668471	5490481	4.5	33.8	0.25	1	1.5	34	29	51352	1.2	20.4	4.1	2.1	1.5	307.8	8.50	105	7.2
1064	669400	5487800	2.1	44.8	1.3	1	1.5	15	28	6049	2.9	14.0	3.5	1.4	1.1	108.5	13.93	66	1.8
1065	669852	5485872	1.5	27.5	0.8	3	1.5	15	16	9658	0.6	10.3	2.0	0.9	0.7	101.8	5.62	31	2.9
1066	671639	5488496	11.2	52.3	1.7	1	1.5	21	21	55598	1.2	13.3	4.0	0.8	1.0	175.9	2.53	73	3.6
1067	672475	5486000	1.0	58.9	2	1	1.5	19	26	17499	1.8	27.8	4.1	1.0	1.2	66.1	2.72	78	4.3
1068	670819	5482429	1.8	45.4	0.25	1	1.5	36	28	61243	1.1	24.8	4.2	1.3	1.2	199.8	5.90	97	11.8
1069	669745	5481387	1.5	39.4	2.7	1	1.5	19	43	35640	2.6	12.5	3.6	1.3	1.0	290.1	19.26	65	4.4
1071	668300	5480275	0.9	44.9	3.3	1	1.5	38	20	81789	3.6	21.1	5.0	0.15	0.6	322.7	7.82	142	14.5
1072	667504	5478773	2.7	48.4	4.3	1	INF	36	24	256794	5.0	15.4	6.5	INF	INF	462.8	10.32	126	13.5
1073	668537	5474366	0.9	51.4	5.6	1	1.5	46	62	91890	4.3	35.9	3.9	2.8	1.8	218.9	48.26	126	5.5
1074	667608	5472388	1.5	29.0	1.9	1	1.5	28	10	12437	0.6	20.5	7.9	0.4	1.3	55.0	1.74	58	5.2
1075	668071	5471248	9.1	65.0	2.2	1	1.5	27	23	12594	1.6	19.1	11.8	0.15	0.15	49.3	1.13	124	1.1

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav.	INAA	INAA	FA/ICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FA/ICPMS	FA/ICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1076	670238	5469999	3.0	62.4	2.5	7	1.5	22	20	5065	1.7	17.1	6.2	0.15	1.0	33.6	1.66	113	3.0
1077	671033	5470846	4.8	56.0	2.7	7	1.5	19	15	172277	2.1	14.7	4.1	1.1	1.2	38.7	0.68	194	3.4
1078	671334	5468723	2.4	38.4	2.7	4	INF	48	40	44944	2.9	32.5	5.5	INF	INF	329.6	24.46	86	17.6
1080	672494	5468929	1.8	52.6	5.3	3	1.5	48	42	65649	2.1	35.0	6.0	2.9	1.5	377.1	26.13	126	18.5
1081	673110	5468776	3.0	55.3	1.5	1	1.5	35	25	58361	1.1	22.4	4.5	1.8	1.5	217.3	10.82	113	9.6
1082	674916	5478658	19.5	24.2	3.2	1	1.5	34	23	29263	2.0	22.7	8.4	1.8	0.9	86.7	13.61	65	9.1
1083	672433	5476876	2.7	35.3	0.25	1	1.5	26	22	5873	0.5	14.5	5.7	1.0	1.2	118.3	8.15	47	4.8
1084	670953	5475488	2.4	16.3	0.25	1	1.5	27	23	6051	0.5	15.7	5.5	0.6	0.5	127.8	8.24	48	4.3
1086	671898	5474494	9.1	23.1	2	1	1.5	48	30	52486	2.1	22.8	6.2	0.9	1.2	113.2	24.35	61	10.0
1087	675163	5475667	1.5	50.6	1.9	3	1.5	17	24	6664	0.7	19.9	3.6	2.4	1.3	74.5	1.49	53	1.5
1088	680475	5472559	5.1	62.6	1.8	1	1.5	20	17	7516	2.4	13.8	4.5	2.7	0.7	85.0	20.28	67	4.3
1089	680092	5471902	6.0	58.6	2.5	1	1.5	19	19	11071	4.2	13.7	2.8	2.5	0.7	41.7	5.70	60	5.0
1090	681317	5470165	3.3	34.6	3	1	1.5	19	19	12916	3.3	13.1	2.3	0.9	1.2	59.9	5.35	53	5.4
1091	680110	5468032	1.3	59.0	3.4	1	1.5	27	23	11219	1.9	16.4	2.7	2.3	1.3	66.2	5.93	51	4.3
1092	679230	5467894	1.3	34.2	0.25	1	1.5	25	23	16727	1.1	21.3	4.1	1.6	1.8	102.0	1.96	59	2.3
1093	680245	5467190	1.2	43.2	1.6	6	1.5	9	9	6990	0.6	10.1	1.9	0.15	0.8	41.5	1.30	30	1.1
1094	680332	5462885	4.8	27.7	5	6	1.5	64	51	102389	1.5	38.4	3.7	3.9	1.2	261.7	8.82	110	13.2
1096	679299	5463200	2.4	37.9	2.2	1	1.5	19	18	14376	1.1	14.6	3.3	2.4	1.7	81.8	3.88	45	2.0
1097	678774	5462788	0.9	39.9	3.2	1	1.5	33	22	44348	3.6	19.6	4.0	2.2	1.4	107.4	6.35	78	3.9
1098	678803	5461316	10.0	40.4	2.2	1	1.5	37	36	77554	2.1	22.7	3.8	2.3	1.5	272.8	4.70	119	4.6
1099	678522	5460017	3.9	41.6	1.4	1	1.5	22	25	7079	0.7	17.3	3.4	0.7	1.2	43.9	0.90	67	1.7
1100	676612	5460631	2.1	26.5	0.9	4	1.5	24	15	10255	0.4	20.8	4.6	0.9	1.2	100.6	2.17	60	4.1
1102	675558	5462059	6.4	32.4	0.9	1	1.5	71	30	108845	1.9	30.9	5.1	1.7	1.3	553.8	5.29	149	12.3
1103	674484	5462479	15.2	40.5	2	1	1.5	30	31	84762	2.9	23.4	4.9	1.8	1.3	227.6	7.34	87	4.8
1104	673888	5462927	8.2	41.4	1.9	7	1.5	26	30	27544	1.3	19.9	3.2	1.3	1.2	175.9	3.92	86	1.4
1105	675380	5464239	10.0	27.1	1.9	3	1.5	47	43	92169	4.1	31.6	5.2	3.0	1.5	166.0	9.79	104	14.9
1106	676531	5464178	4.2	25.7	2.2	1	1.5	40	39	42202	1.6	25.3	3.6	2.4	0.9	206.5	11.10	91	9.9
1107	675866	5466575	4.2	28.1	1.7	2	1.5	36	49	36730	2.6	31.9	4.1	3.2	1.0	157.4	11.34	76	11.2
1108	675114	5467009	17.3	59.7	2.1	1	1.5	39	49	22540	4.3	25.6	6.2	3.6	2.1	113.9	19.84	82	6.3
1109	676527	5468128	4.5	38.0	2	1	1.5	20	48	16005	1.6	16.3	2.6	1.8	1.3	204.7	5.58	66	1.1
1110	677781	5468420	3.0	32.8	0.8	1	1.5	20	24	7308	0.5	17.2	2.1	1.2	1.2	113.9	1.94	38	1.7
1112	677751	5470286	6.7	50.1	3.4	3	1.5	73	73	88072	2.0	32.3	4.8	6.2	2.4	285.3	18.32	125	12.8
1113	678380	5470848	10.0	49.8	3.9	1	1.5	42	29	77018	2.7	19.6	5.8	2.9	1.4	91.1	5.77	89	5.3
1114	677424	5472326	3.0	44.4	3.4	1	1.5	41	28	51772	1.1	20.8	5.1	1.5	0.7	120.6	25.51	74	7.9
1115	675497	5469617	1.5	43.2	0.25	1	1.5	18	18	17965	1.1	13.9	1.9	1.0	1.3	97.7	5.29	50	1.8
1116	672129	5466026	1.8	51.4	2.3	1	1.5	13	20	8090	1.0	14.5	2.6	1.0	1.1	96.6	3.96	68	1.8
1118	671412	5461195	10.6	47.6	1.1	1	1.5	26	28	21380	2.5	16.8	5.3	1.9	1.7	101.4	5.51	52	2.7
1119	668921	5460390	9.1	59.7	2.3	1	1.5	18	20	6095	2.0	13.9	4.8	1.6	0.8	33.7	1.06	95	2.6
1120	668640	5460775	7.0	36.7	2.7	4	1.5	60	77	168372	3.0	30.0	5.3	3.7	1.4	646.1	21.22	122	17.9
1121	667785	5460584	2.4	52.2	1.5	5	1.5	14	15	8425	0.8	13.0	2.5	0.7	1.2	46.0	0.92	66	2.3
1122	666825	5460173	3.0	43.1	1.7	1	1.5	37	27	47090	1.2	20.4	3.7	1.7	1.5	214.5	6.35	78	10.2
1123	666042	5460084	2.1	35.9	1.5	1	1.5	15	19	6954	0.7	14.9	1.9	0.5	0.9	57.1	1.51	44	1.0
1124	665417	5460347	6.7	49.9	1.3	1	1.5	40	37	152419	3.9	22.3	4.9	2.2	1.6	564.2	6.39	106	16.7
1125	664879	5459362	4.5	42.3	2.2	1	1.5	19	35	7129	2.0	13.8	3.5	1.3	1.5	230.6	7.58	78	5.7
1126	664077	5459458	3.6	43.8	0.25	1	1.5	28	27	32455	0.7	16.8	3.1	1.2	1.4	392.4	2.73	68	4.7
1128	663976	5460415	3.6	30.1	1.4	7	1.5	42	42	62316	1.4	25.4	4.0	1.6	1.4	562.0	8.43	89	11.5
1129	664005	5461081	1.8	28.6	0.9	1	3	15	17	8872	1.1	10.2	1.9	0.5	0.8	85.2	2.85	28	2.1
1130	665577	5461318	1.5	54.3	2.3	3	1.5	23	42	53195	8.5	18.9	4.4	2.8	1.6	363.7	14.14	162	3.5
1131	666437	5461440	3.0	53.2	2.3	5	1.5	25	31	14421	4.1	17.3	4.9	1.2	1.2	132.9	6.73	114	3.9
1132	666632	5463410	1.8	41.8	0.25	3	1.5	36	43	37640	1.4	26.0	3.3	2.2	1.7	127.0	1.04	87	2.0
1134	669547	5462921	5.7	27.9	3.6	9	1.5	60	40	152783	2.5	25.9	4.7	1.7	0.8	600.4	16.68	146	20.0
1135	670226	5465823	0.9	49.8	2.8	1	1.5	24	17	43839	2.1	17.2	4.2	0.8	1.3	145.9	6.49	116	8.4
1136	669426	5466610	3.0	43.3	3.7	1	1.5	45	24	183853	1.6	22.0	4.9	0.9	1.6	542.4	4.98	124	15.3
1137	670279	5467579	6.7	26.6	1.7	6	1.5	50	36	178136	3.1	24.6	5.6	2.4	1.1	571.2	15.65	121	19.2
1138	673660	5470054	1.2	47.5	4.5	6	1.5	34	29	71494	2.0	24.8	4.5	2.9	1.9	539.8	14.70	115	14.3
1139	673375	5471377	2.1	24.6	5.1	3	3	18	63	13470	3.0	23.0	4.8	8.0	2.4	107.0	28.33	89	7.6
1140	674014	5472419	0.9	35.2	0.25	1	1.5	19	27	5011	0.6	14.3	6.4	1.3	1.3	84.0	19.45	60	6.5
1141	664195	5480699	2.4	62.1	2.3	2	1.5	16	17	26607	4.6	11.1	5.9	0.7	0.6	175.3	18.41	116	4.3
1142	662415	5479442	2.4	19.7	1.6	1	1.5	18	11	20255	2.0	10.8	3.9	1.7	1.2	209.0	7.65	56	10.7
1144	661707	5478820	12.1	44.1	2.1	4	1.5	23	30	17735	3.9	12.4	6.1	0.6	0.7	567.2	16.70	115	2.3
1145	658792	5479553	5.1	31.1	2.5	1	1.5	26	16	43462	3.7	12.6	6.6	0.4	0.9	580.1	24.55	128	3.2
1146	656273	5478597	5.1	46.2	3.1	1	1.5	20	21	13909	1.8	11.4	4.6	0.5	0.5	249.5	13.06	65	1.9
1147	654088	5478671	6.0	47.1	2.4	1	1.5	18	23	31963	3.2	15.0	5.2	0.6	0.7	553.8	7.34	98	1.3
1148	651134	5477659	6.0	56.8	2.3	1	1.5	24	20	9170	2.1	16.7	7.1	0.5	0.8	74.4	4.34	184	2.4
1150	648418	5478961	4.5	39.7	4.4	7	1.5	42	26	83362	2.6	23.2	7.2	1.2	1.0	214.4	3.65	133	22.6

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav.	INAA	INAA	FA/ICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FA/ICPMS	FA/ICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1151	647958	5478365	1.5	62.6	3.4	6	1.5	22	23	29005	2.3	12.9	6.4	0.9	0.7	121.0	2.35	172	7.8
1152	647847	5474442	9.1	67.9	5.9	1	1.5	22	27	24385	6.3	19.8	3.1	3.4	1.1	72.0	23.45	78	5.4
1153	648619	5474852	13.7	71.0	2	1	1.5	12	14	5638	1.4	10.2	3.6	0.15	0.5	22.7	1.08	105	1.0
1154	648782	5475402	13.4	53.6	1.2	3	1.5	16	13	5659	1.3	10.8	3.8	0.4	1.5	30.4	1.87	94	1.4
1155	652544	5475224	1.0	NS															
1156	653844	5477099	2.1	16.4	1.1	1	1.5	22	11	8556	3.3	14.2	4.8	1.9	1.1	109.7	12.89	25	14.7
1157	658953	5477587	1.2	61.0	0.25	1	1.5	4	6	8120	0.8	3.7	2.5	0.15	0.4	30.2	1.27	28	0.7
1158	660476	5477514	2.1	33.9	1.7	1	1.5	29	12	69903	1.8	13.6	4.2	0.7	1.2	530.1	9.77	92	15.5
1160	662955	5477666	6.7	43.4	3	5	1.5	30	26	88034	6.2	15.3	8.8	1.1	0.15	604.9	33.98	99	18.3
1161	663192	5478874	15.2	43.3	3.6	7	INF	19	22	52835	8.5	11.6	13.0	INF	INF	528.1	21.99	75	6.8
1162	664096	5478065	2.4	12.6	0.25	2	1.5	13	8	15371	1.7	7.1	3.7	0.8	0.6	118.8	8.72	36	8.8
1163	662914	5476274	3.6	35.6	2.1	1	1.5	15	14	14255	1.7	10.6	5.1	0.7	0.4	110.4	8.50	71	4.0
1164	664006	5476267	2.1	67.2	1.7	1	1.5	20	19	11472	1.9	13.1	6.9	0.5	0.6	54.6	3.27	162	3.9
1166	664839	5476414	6.0	43.3	4.3	3	1.5	29	32	124310	6.4	18.5	9.3	2.2	1.4	597.2	33.50	119	11.5
1167	667703	5477923	1.5	49.0	3.5	2	1.5	42	25	51864	2.1	26.6	9.5	1.3	0.6	202.3	7.92	110	12.7
1168	660224	5484585	1.8	8.7	0.25	1	1.5	15	9	16242	0.9	8.4	2.9	0.5	0.7	107.2	11.54	53	10.1
1169	660108	5483431	1.8	24.4	1.7	5	1.5	30	13	40452	1.9	14.5	5.3	0.8	0.6	383.1	16.03	104	14.0
1170	659086	5483256	2.1	22.8	0.25	4	1.5	23	12	35140	1.2	11.8	4.7	0.7	1.0	332.4	15.10	85	10.6
1171	657383	5484108	5.7	24.8	1.9	1	1.5	38	21	132237	2.7	17.2	5.1	1.7	0.7	557.2	23.20	142	13.6
1172	655041	5484285	0.6	35.3	0.25	1	1.5	9	11	5999	0.6	9.8	3.5	0.4	0.7	61.1	2.43	36	1.5
1173	654351	5484033	6.4	25.8	4.3	1	1.5	31	21	68089	2.2	13.0	4.7	1.5	0.8	181.7	9.75	71	10.1
1174	654108	5484348	7.6	40.2	2.2	5	1.5	41	27	113781	2.7	19.1	5.2	1.1	0.8	457.1	6.79	110	9.9
1175	652922	5484167	6.0	54.9	3	1	1.5	17	29	5811	1.3	11.8	4.6	0.9	1.2	151.9	4.25	79	3.6
1177	652498	5483318	4.8	70.3	3.8	9	1.5	23	46	31618	3.0	14.1	3.8	2.2	1.0	316.0	10.08	90	11.5
1178	649322	5481456	1.8	50.1	5.2	2	1.5	32	23	283096	4.9	10.8	4.0	1.3	0.6	575.4	3.74	100	13.9
1179	648048	5480185	4.2	37.9	2.2	1	1.5	36	18	47972	1.1	17.0	4.3	0.6	0.8	190.9	2.65	97	7.5
1180	651270	5480439	3.9	23.2	3.9	1	1.5	40	19	104996	1.4	20.0	5.3	1.2	1.1	244.1	11.84	128	11.8
1181	653520	5481596	1.5	NS															
1183	653638	5479706	2.7	NS															
1184	655662	5481462	5.1	23.6	2	1	1.5	37	16	81653	1.3	16.6	4.8	0.7	0.6	229.0	12.51	117	11.8
1185	658813	5482154	3.0	24.4	2.2	1	1.5	23	11	29121	1.6	12.5	5.7	0.4	0.7	211.3	13.64	97	5.1
1186	659956	5482468	3.6	36.7	2.9	1	1.5	31	16	48309	1.8	15.1	6.1	1.3	0.9	543.4	24.28	135	9.1
1187	662903	5481573	0.7	36.2	0.25	1	1.5	7	8	8211	1.9	6.9	2.5	0.3	0.5	104.6	10.36	34	2.0
1188	663285	5481507	3.9	15.3	1.3	1	1.5	18	14	5473	1.8	8.7	8.6	0.8	0.5	147.2	15.54	67	4.6
1189	663235	5482511	0.9	32.4	2.1	1	1.5	14	9	11873	2.9	8.8	3.2	0.9	0.6	114.7	20.08	49	2.7
1190	663205	5484050	5.7	56.1	3.7	2	1.5	33	24	132434	10.6	12.2	5.3	2.3	0.9	546.4	86.87	123	8.1
1191	664266	5483546	1.8	50.1	1.9	3	1.5	18	14	36389	9.6	10.2	4.7	0.7	0.6	74.4	22.02	103	4.3
1192	667693	5482471	3.0	38.8	2.8	3	1.5	NM	22	304859	NM	NM	NM	0.7	0.7	NM	NM	169	NM
1194	668409	5482121	2.1	54.8	0.25	1	1.5	15	11	23191	0.9	8.5	3.0	0.9	0.6	74.0	6.16	53	4.0
1195	668492	5483318	1.5	50.3	5.1	1	1.5	34	23	135050	6.3	18.3	5.6	1.6	0.6	224.7	16.49	143	11.6
1196	665772	5474780	5.1	33.1	4.1	1	1.5	37	34	115532	7.4	20.7	11.8	2.0	0.9	654.6	38.76	102	12.8
1197	664819	5474681	4.2	47.6	3.7	1	INF	47	49	131859	13.7	27.5	10.5	INF	INF	666.9	62.87	155	16.1
1198	663472	5473853	1.2	NS															
1200	661377	5473691	1.5	26.9	0.25	6	INF	50	33	177483	7.3	27.1	6.5	INF	INF	723.7	34.98	122	22.3
1201	660349	5473000	5.4	26.3	2.4	1	INF	44	24	372598	20.4	22.2	6.3	INF	INF	710.6	30.30	199	9.9
1202	658878	5472719	4.2	17.1	0.25	3	1.5	37	18	181224	8.2	17.7	5.9	1.1	0.6	673.2	20.97	110	11.4
1203	657882	5472931	4.2	11.0	0.25	1	1.5	26	12	134622	6.0	12.2	4.7	0.9	0.4	633.5	13.97	82	8.8
1204	656355	5474192	0.9	57.6	4.6	1	1.5	18	17	196179	5.3	14.0	5.2	0.8	0.9	110.4	5.62	147	4.7
1205	655584	5473387	4.5	66.9	4.5	1	INF	20	30	18387	12.1	16.8	5.0	INF	INF	86.6	30.45	168	9.5
1206	654854	5473934	3.0	37.0	3.3	7	1.5	19	24	16755	2.8	12.1	4.4	1.1	0.7	240.2	33.57	62	4.4
1207	654338	5475017	3.0	19.3	0.25	5	1.5	38	37	59127	4.8	27.0	4.5	0.9	0.4	658.0	34.71	110	19.6
1208	649166	5472874	3.0	57.4	0.25	1	4	29	20	12985	1.5	18.4	8.6	0.8	0.5	104.5	4.40	150	4.1
1209	651068	5469122	7.6	33.8	3.7	7	1.5	49	34	79832	5.3	24.9	6.8	1.0	0.5	657.3	16.18	122	10.5
1211	654007	5470781	3.0	51.2	4.1	7	1.5	20	23	13205	2.8	18.6	3.9	0.9	0.6	89.0	2.77	71	1.5
1212	655004	5471196	1.2	45.0	1.5	1	1.5	16	15	10696	1.5	12.5	3.3	0.5	1.5	97.2	2.85	42	1.8
1213	657636	5470880	0.3	35.1	1.2	1	1.5	15	8	17198	2.6	10.1	1.7	0.5	0.7	81.6	1.24	46	3.5
1214	661116	5471593	7.0	47.5	3.4	5	INF	50	28	88138	2.0	18.8	5.1	INF	INF	705.8	13.21	111	16.4
1215	660843	5470599	9.1	34.2	0.7	5	1.5	24	25	15967	2.5	15.2	3.1	0.8	0.8	195.2	4.66	57	2.7
1217	660815	5469249	4.5	39.0	0.7	5	1.5	53	21	156270	2.6	17.2	3.9	2.4	1.2	742.4	8.57	117	19.4
1218	662172	5469757	3.0	47.7	1.8	4	1.5	39	21	79911	1.6	16.0	4.0	2.4	1.2	717.4	7.20	76	9.5
1219	665142	5469268	4.5	56.3	3.6	3	1.5	26	36	19331	5.2	19.9	4.9	1.9	0.8	209.6	5.41	87	13.4
1220	664773	5470521	1.5	56.9	2.3	6	1.5	31	32	75374	2.9	18.5	6.0	1.4	1.2	764.1	8.01	108	16.5
1221	665385	5470262	3.0	31.5	2.4	1	1.5	29	21	105234	2.7	14.2	5.9	1.5	0.8	808.6	8.60	88	14.9
1222	673396	5474098	2.4	18.2	0.9	4	1.5	19	7	5553	0.3	12.3	6.1	1.6	0.7	31.0	0.48	45	2.9
1223	670523	5473649	4.5	65.3	2.2	1	1.5	94	94	7227	7.0	38.9	3.1	2.8	1.4	141.1	32.51	84	2.8

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav	INAA	INAA	FA/ICPMS	ICPMS	ICP/OES	ICP/OES	ICPMS	ICPMS	ICPMS	FA/ICPMS	FA/ICPMS	ICPMS	ICPMS	ICP/OES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1224	665977	5471424	0.9	56.5	3.3	1	1.5	14	10	17495	1.3	12.4	3.4	1.9	1.3	58.4	1.87	58	1.8
1225	657708	5467951	4.8	51.8	0.9	1	1.5	28	17	68541	1.8	15.3	6.6	2.1	1.1	270.0	2.47	84	5.7
1226	656456	5468476	1.5	52.2	2.9	1	1.5	24	83	48036	4.8	16.7	5.1	2.1	1.2	158.8	2.31	107	3.7
1228	656778	5469514	1.5	50.3	3.2	2	1.5	19	16	48416	3.7	16.1	3.0	2.1	1.1	152.3	1.82	92	1.6
1229	655562	5468709	1.8	56.2	0.7	1	1.5	15	11	12307	1.8	11.3	3.2	1.5	0.8	202.7	2.32	47	1.6
1230	653995	5467319	2.4	30.1	0.7	4	1.5	5	23	61445	0.4	2.7	1.5	2.7	1.3	111.7	2.73	76	1.3
1231	652806	5466846	1.5	NS															
1233	651562	5467019	3.9	68.3	3.3	4	1.5	20	10	118533	2.5	11.6	4.7	1.5	0.5	124.2	1.26	152	4.4
1234	650583	5464315	1.5	50.3	1.1	6	1.5	16	14	9587	0.7	13.8	2.0	1.6	2.5	176.0	1.45	41	3.1
1235	653231	5463936	2.1	58.0	0.9	1	1.5	26	25	38429	2.3	16.9	5.1	2.0	1.0	704.1	3.15	83	2.5
1236	653141	5465691	0.9	28.7	3.5	1	1.5	45	18	230945	6.2	16.5	3.8	2.9	1.0	3047.5	17.53	103	11.8
1237	654402	5466071	1.5	32.5	3.5	1	1.5	35	18	6842	1.3	18.5	6.5	2.6	1.0	399.6	3.34	53	5.3
1238	657335	5466073	3.9	55.0	3.1	1	1.5	36	13	50972	3.3	16.4	6.0	2.7	1.0	771.8	5.65	83	4.5
1239	657770	5465012	1.8	57.9	1.2	1	1.5	14	8	12722	0.9	8.0	3.1	1.9	0.9	523.5	0.81	84	1.4
1240	660441	5465414	2.1	37.3	3.1	1	1.5	21	12	20237	1.7	11.6	2.9	1.3	1.0	29.6	2.58	49	3.7
1241	660145	5465687	0.7	46.1	1.1	1	1.5	20	12	22777	1.3	11.2	3.3	1.6	1.1	30.0	2.39	43	3.7
1242	660074	5466586	6.0	39.0	6	1	1.5	74	24	136183	3.9	21.2	4.5	0.9	0.6	133.2	6.37	121	12.9
1243	661295	5466300	1.8	44.7	1.1	1	1.5	16	20	61203	2.8	7.9	2.0	1.3	0.9	38.8	3.25	75	2.0
1245	661730	5465731	1.2	37.8	3.1	2	1.5	31	18	47968	7.1	15.3	2.2	1.2	0.5	75.7	5.74	77	2.7
1246	661661	5465022	1.5	42.4	2.3	1	1.5	26	22	29086	7.3	13.4	3.3	1.2	0.6	52.6	7.85	74	2.1
1247	663619	5465011	1.9	59.4	2.1	1	1.5	0.5	12	29404	0.2	0.25	0.5	1.7	1.6	109.6	0.43	90	0.05
1248	664365	5465760	7.3	26.3	2.6	10	1.5	30	30	46248	2.7	13.4	2.8	1.8	0.9	>14549.0	7.40	94	2.8
1250	663244	5463117	2.4	35.0	0.25	5	1.5	45	20	37568	1.3	18.0	3.1	1.7	1.1	1679.8	6.34	73	5.9
1251	664428	5462869	5.1	30.9	0.25	3	1.5	24	21	55052	0.6	9.9	1.7	2.5	1.3	1174.4	3.23	81	3.9
1252	665004	5462640	9.1	50.0	0.25	5	1.5	20	28	4291	2.8	12.9	2.7	1.7	1.1	383.8	7.58	68	0.8
1253	667221	5486870	1.5	37.3	0.25	2	1.5	31	17	21858	0.9	11.5	3.9	1.8	0.9	596.6	25.71	57	5.2
1254	667790	5487419	1.5	36.4	0.25	2	1.5	41	25	26028	0.8	20.6	3.0	2.2	1.4	727.1	20.26	89	6.8
1255	666046	5487701	2.8	57.2	1.7	1	1.5	9	25	8191	0.5	5.3	1.7	1.4	0.15	62.2	1.49	91	0.9
1256	665354	5488285	2.7	29.9	2.3	1	1.5	14	15	93350	2.1	5.4	1.1	2.1	0.7	119.8	7.89	50	3.2
1257	665229	5489177	4.8	30.2	2.9	1	1.5	45	27	72555	2.7	19.2	4.1	2.3	0.9	1741.6	26.67	94	13.0
1258	665284	5490241	3.6	27.7	3.1	1	1.5	29	26	70362	1.0	14.2	2.3	2.0	1.2	1227.1	13.93	130	9.5
1259	664739	5493693	5.4	23.7	1.4	1	1.5	36	19	38535	1.2	17.4	4.0	1.5	0.7	313.7	6.87	80	5.0
1260	665465	5494350	4.5	33.7	2.6	6	1.5	41	26	32819	1.6	22.7	4.6	1.4	0.7	434.6	8.44	84	3.9
1262	663751	5495019	9.4	34.4	2.5	1	1.5	46	22	69852	2.1	18.1	3.7	1.6	1.0	333.7	11.02	150	4.6
1263	663314	5496523	0.9	35.5	0.25	1	1.5	19	13	19162	0.9	14.1	1.7	1.1	1.1	110.6	3.82	70	2.2
1264	659823	5497149	0.9	32.1	1.3	1	1.5	NM	14	8629	NM	NM	NM	1.3	1.0	NM	NM	43	NM
1265	659361	5497481	2.4	44.6	0.25	1	1.5	49	25	62873	1.2	18.7	2.4	1.7	0.8	961.6	11.32	123	9.3
1267	658571	5498182	9.7	41.4	3	1	1.5	39	35	19543	2.1	16.5	2.6	0.7	1.1	332.7	8.95	74	2.3
1268	658721	5501728	1.5	38.3	2.6	1	1.5	19	24	12614	0.8	12.8	2.2	1.2	0.8	173.1	19.58	62	0.9
1269	657706	5501982	4.8	42.8	2.8	1	1.5	28	20	23052	1.0	14.0	2.5	1.3	0.9	150.8	7.54	61	1.7
1270	656533	5503628	3.3	43.5	5.1	1	1.5	19	19	16614	2.5	9.2	1.9	1.6	0.5	38.4	3.88	69	1.5
1271	656139	5504796	3.0	36.1	3.9	1	1.5	56	27	113805	2.1	19.2	3.7	2.3	0.9	248.5	10.38	113	14.6
1272	655170	5505351	2.4	36.2	6.8	1	1.5	32	39	35222	6.7	24.8	6.5	4.0	1.7	75.8	19.96	71	8.2
1273	653193	5509779	1.5	55.8	2.7	1	1.5	3	29	6018	0.3	3.8	1.4	1.3	0.5	18.3	1.30	80	0.4
1274	657384	5507245	9.1	48.3	5	1	1.5	58	46	59779	2.6	23.5	6.5	2.7	1.2	645.2	5.66	117	13.7
1275	661580	5506154	7.6	55.8	3.3	1	1.5	20	37	6997	1.2	11.9	4.7	0.6	0.5	226.2	5.59	68	1.3
1276	660672	5505482	8.2	39.1	1.8	1	1.5	13	18	36086	0.5	5.7	2.2	1.4	0.9	101.2	4.45	87	1 3
1277	660678	5503413	4.5	48.2	0.25	1	1.5	21	23	5158	1.6	11.4	4.1	1.3	0.6	136.0	15.70	65	0.4
1279	660478	5502534	10.6	50.5	0.25	1	1.5	18	24	4143	1.5	11.2	3.0	1.2	1.0	77.1	10.66	66	0.7
1280	659874	5502200	2.2	38.2	2.9	2	1.5	22	28	16722	2.3	12.6	3.5	2.3	1.2	153.2	10.44	72	4.1
1281	663179	5501861	1.5	38.2	0.25	1	1.5	15	15	10812	1.0	12.6	2.8	1.3	0.7	87.2	9.21	43	1.1
1282	663912	5502667	0.9	37.0	0.25	3	1.5	14	17	6696	1.3	13.2	3.7	1.4	0.7	104.3	19.43	36	0.8
1283	678980	5500136	2.1	NS															
1285	678865	5501572	1.8	75.8	0.25	1	1.5	15	12	14430	0.9	8.8	3.9	0.5	0.6	50.8	0.98	56	2.0
1290	678494	5510064	6.0	44.2	3.5	4	1.5	31	30	24272	1.9	18.1	5.4	1.7	0.7	156.3	18.17	81	2.9
1291	677543	5510371	4.8	36.0	1.9	1	1.5	32	25	19467	1.6	18.3	6.0	1.7	0.6	147.5	12.88	65	2.6
1292	674875	5508427	0.9	35.2	0.25	1	1.5	15	19	5915	1.2	13.4	3.7	1.0	0.4	110.6	9.89	38	1.4
1293	672600	5509500	11.5	26.6	1.5	4	1.5	48	24	70714	1.1	21.1	7.3	1.4	0.7	279.2	22.90	144	10.4
1294	673503	5507199	4.5	11.7	1.8	3	1.5	28	12	35968	0.5	14.1	3.7	1.0	0.6	144.1	12.88	81	8.1
1296	672677	5505015	5.4	14.1	0.25	1	INF	27	13	45265	1.1	13.4	5.7	INF	INF	152.0	14.80	89	6.4
1297	670591	5507771	3.9	11.8	1.1	1	1.5	32	15	18843	0.6	16.1	4.4	1.1	0.6	118.0	14.43	60	8.0
1298	669407	5509711	5.7	23.9	1.4	1	1.5	25	11	21590	0.3	11.9	3.7	1.1	0.7	111.2	10.24	50	6.2
1299	665951	5508628	5.7	13.1	2.2	1	1.5	33	15	36512	0.4	15.1	4.4	0.7	0.7	137.7	8.73	71	7.6
1300	667061	5507059	4.2	54.6	2	3	1.5	NM	20	21360	NM	NM	NM	1.1	0.4	NM	NM	85	NM
1302	669237	5504689	16.4	48.5	0.25	2	1.5	32	39	26609	2.4	14.3	11.4	1.0	1.0	852.0	42.63	93	1.7

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method------->		Depth	Grav	INAA	INAA	FAICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FAICPMS	FAICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit------->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units------->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1303	667198	5503372	3.6	40.4	1	1	1.5	25	18	29028	0.5	12.3	5.2	1.1	0.8	123.2	24.00	111	4.9
1304	665158	5502568	0.9	49.3	1.6	2	1.5	15	17	3974	1.2	13.2	4.1	0.9	0.9	59.0	6.28	38	1.4
1305	667144	5500852	1.6	NS															
1306	669137	5501387	0.9	33.0	0.25	1	1.5	11	10	8822	1.6	8.7	5.0	0.8	0.6	92.2	34.00	43	0.9
1307	667277	5499020	1.2	53.5	1.3	1	1.5	9	11	8942	0.9	9.5	4.5	1.2	0.5	42.9	3.68	46	0.2
1308	663353	5499507	2.1	54.5	1.9	1	1.5	17	10	25433	1.2	11.2	3.2	0.9	0.6	47.4	1.07	81	1.0
1309	664514	5498331	1.2	60.6	2	1	1.5	32	15	103202	1.4	13.1	3.2	0.9	0.5	208.6	4.23	108	11.8
1310	664117	5497265	0.9	44.0	2.5	1	1.5	21	12	27123	1.1	12.0	2.6	1.4	0.5	129.7	6.78	64	5.1
1311	662541	5462803	2.4	38.8	0.25	1	1.5	43	16	63189	1.7	19.7	4.4	2.7	1.2	144.5	1.95	125	7.3
1313	662005	5462690	19.5	45.1	1.6	6	1.5	29	23	167860	3.5	12.3	4.4	1.0	0.4	137.4	3.47	76	4.3
1314	660307	5463552	7.3	56.1	0.9	3	1.5	22	37	34684	3.1	18.2	6.4	2.7	1.7	446.9	9.90	100	6.1
1315	659526	5462278	4.2	37.0	0.7	3	1.5	40	26	57786	1.2	17.6	5.5	3.1	1.5	309.8	10.82	87	8.7
1316	657592	5461196	0.9	51.1	1	2	1.5	17	10	38341	4.7	9.2	4.3	2.9	1.1	42.9	2.78	96	2.2
1317	658670	5460721	3.9	42.5	4.3	1	1.5	43	33	37199	3.5	21.6	7.2	2.4	0.8	161.7	10.55	91	8.9
1319	659780	5459498	1.5	36.6	1.1	3	1.5	25	15	10770	1.3	16.4	5.3	1.2	0.8	63.2	1.30	75	3.2
1320	657136	5458474	3.6	33.5	1.7	3	1.5	19	20	8043	1.2	12.5	3.2	1.4	0.9	112.9	2.45	63	1.5
1321	656189	5458292	6.7	27.3	1.1	2	1.5	62	31	94366	3.8	20.8	5.4	2.1	0.8	447.8	40.12	114	8.9
1322	655853	5457593	3.9	32.3	0.7	3	1.5	38	22	17613	1.1	13.2	4.5	3.4	1.4	136.3	11.51	53	4.6
1323	655199	5459185	1.5	9.8	0.9	3	1.5	20	9	5627	0.5	11.6	5.1	0.4	0.5	36.3	0.89	36	2.4
1324	653492	5459467	0.9	19.7	1.5	1	1.5	24	9	5888	0.6	10.2	7.1	0.5	0.6	30.8	0.67	59	3.3
1325	656011	5456414	4.8	19.3	3.5	1	1.5	31	24	44093	2.6	17.3	3.6	6.8	2.6	172.0	10.07	69	12.1
1326	656447	5456008	13.7	31.6	0.9	2	1.5	51	32	120716	4.2	20.8	5.0	3.3	1.0	466.9	10.94	130	9.7
1327	655146	5455109	1.8	42.7	5.3	2	1.5	45	30	129810	3.2	19.7	3.0	4.0	1.3	210.1	13.48	125	8.7
1328	654659	5455056	4.2	34.1	2.4	1	1.5	34	17	7065	1.2	10.8	3.2	2.6	0.5	37.2	9.04	46	2.2
1330	656131	5452853	4.5	41.1	1.2	2	1.5	23	28	7771	1.2	16.3	2.8	1.7	0.7	106.2	2.56	59	1.1
1331	657526	5453084	6.0	38.3	2.8	2	1.5	29	29	16757	1.3	19.0	3.8	2.0	1.3	191.2	3.62	63	2.2
1332	656120	5450826	10.0	27.1	2.5	1	1.5	36	101	55344	1.9	24.8	7.8	3.7	1.4	571.3	9.11	72	7.1
1333	654186	5449237	5.4	51.5	0.25	1	1.5	27	15	14391	1.3	18.9	4.8	1.4	0.8	60.5	1.09	102	1.7
1334	653180	5448879	1.5	58.1	0.25	2	1.5	36	34	21490	2.6	23.1	2.7	0.8	0.4	244.4	4.45	89	11.8
1336	649175	5448835	1.2	57.7	2.1	1	1.5	16	14	17540	0.9	13.2	3.5	1.8	0.9	96.9	1.51	60	2.2
1337	651595	5444881	0.9	44.2	1.8	1	1.5	11	7	12682	0.5	8.6	2.5	1.4	0.7	31.6	0.31	56	2.1
1338	653061	5444238	0.9	74.8	0.25	1	1.5	15	9	26454	0.7	10.4	2.5	1.9	0.7	48.1	0.52	104	3.8
1339	654532	5445450	1.8	34.1	0.8	1	1.5	25	10	22803	0.5	11.6	2.3	0.3	0.4	59.7	1.19	74	4.8
1340	657081	5448536	16.4	32.8	0.25	1	1.5	40	25	55618	1.3	17.0	5.4	2.2	0.9	200.9	2.21	84	6.5
1341	662327	5445503	0.9	47.3	1.6	1	1.5	10	9	309622	1.7	5.7	3.6	1.3	0.6	9.2	0.27	311	1.7
1342	665245	5447237	5.4	54.3	2.8	2	1.5	31	39	13142	1.5	13.3	3.7	2.1	1.2	121.2	1.76	95	2.5
1343	664896	5447873	2.7	36.6	1	2	1.5	64	34	90487	0.9	25.7	6.0	3.2	1.2	479.3	5.05	118	12.7
1344	666635	5447893	7.9	39.1	1.6	1	1.5	61	19	251858	1.3	14.9	2.4	2.9	2.2	487.9	2.31	109	10.3
1345	667450	5450104	4.2	48.4	0.25	6	1.5	70	23	185958	1.0	13.8	2.4	1.6	0.5	487.1	2.09	102	11.5
1347	669240	5451256	2.4	48.3	3.5	7	1.5	55	9	249920	2.7	12.2	1.4	1.2	0.3	452.0	1.72	170	10.7
1348	668958	5453121	2.1	51.7	2.1	1	1.5	22	7	15889	0.8	9.4	2.3	1.2	0.9	59.1	1.00	116	4.9
1349	666061	5453347	7.3	34.2	0.25	5	1.5	38	29	23101	1.5	16.5	4.5	1.1	1.1	209.5	7.21	68	2.6
1351	666262	5452437	12.8	33.2	2.1	2	1.5	85	45	288213	6.4	29.7	4.7	2.9	1.0	551.4	10.34	134	12.6
1353	665803	5451058	12.1	38.9	3.4	7	1.5	74	33	200267	3.8	20.2	5.1	2.4	0.9	520.9	5.85	120	11.6
1354	662695	5451397	3.3	38.2	2.6	1	1.5	28	31	13898	1.4	18.8	2.6	1.2	1.1	112.7	1.83	101	2.3
1355	660396	5449979	8.8	45.7	0.25	1	1.5	28	28	17327	1.3	16.5	5.1	1.0	0.5	110.0	1.30	58	1.7
1356	659965	5452020	14.9	56.7	2.8	1	1.5	32	37	62717	1.7	17.1	4.4	0.9	0.5	137.0	1.69	64	2.4
1357	660927	5453019	5.4	33.5	0.25	1	1.5	31	31	20771	1.2	17.5	3.9	1.1	0.4	123.0	1.75	86	2.1
1358	663305	5452354	6.0	46.0	1.5	1	1.5	22	29	17325	1.4	17.0	4.4	0.4	1.0	84.4	1.36	74	1.7
1359	663333	5453367	1.8	46.3	2.7	1	1.5	21	25	10492	1.1	16.5	3.3	1.0	0.6	64.2	1.38	69	1.5
1360	661468	5454476	1.5	33.9	1.9	1	1.5	16	16	7311	1.0	11.7	2.8	0.8	0.6	52.3	1.79	43	1.4
1361	662968	5454973	3.0	31.1	0.25	1	1.5	18	16	11640	0.7	12.8	3.3	0.3	0.7	53.3	1.04	50	1.7
1362	663926	5455869	4.5	51.4	1.6	1	1.5	21	21	8797	0.7	13.6	3.0	0.3	0.6	71.0	1.56	59	1.6
1364	663023	5456566	6.0	57.7	0.25	1	1.5	26	30	23565	1.7	18.4	5.9	0.9	0.7	126.7	2.25	100	1.5
1365	661688	5456917	1.5	39.7	0.25	1	1.5	24	32	21267	1.5	20.1	3.7	0.7	0.7	127.7	3.25	78	1.6
1366	658693	5457135	6.0	37.2	2.1	1	1.5	41	24	52679	1.5	18.2	5.3	1.7	1.0	280.3	5.74	76	5.1
1367	663301	5457635	4.2	29.9	0.25	4	1.5	18	22	5778	0.7	12.6	3.2	0.6	0.5	50.7	1.64	33	1.4
1368	663316	5458900	2.1	36.3	0.3	3	1.5	37	28	42590	0.8	19.3	4.1	1.4	0.8	522.2	4.35	70	6.9
1370	662329	5461210	1.5	54.9	3.4	1	1.5	45	19	36830	3.2	20.4	5.4	1.6	0.9	152.7	4.74	57	7.1
1372	669247	5459920	3.0	42.1	0.7	1	1.5	17	24	5037	1.3	11.0	3.5	2.1	0.9	80.6	4.70	52	1.1
1373	668550	5459472	6.7	42.6	2	5	1.5	67	44	150707	2.6	29.4	7.5	4.1	1.4	558.9	11.13	126	16.5
1374	668778	5458705	6.7	42.6	2.7	5	1.5	56	44	150973	4.3	24.7	6.3	1.7	0.7	553.1	11.10	129	13.1
1375	666444	5457062	4.5	43.1	0.25	1	1.5	30	44	6687	2.2	17.7	4.1	2.1	0.6	192.6	7.39	78	2.2
1376	666467	5454678	9.1	20.6	2.3	1	1.5	28	43	8995	2.1	15.3	2.6	3.5	0.3	106.3	9.17	46	4.0
1377	654674	5442485	0.7	27.2	1.7	1	1.5	28	10	24665	0.4	15.3	6.7	1.7	0.6	66.4	1.10	72	4.6

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav.	INAA	INAA	FA/ICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FA/ICPMS	FA/ICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1378	655508	5442458	4.2	52.4	3.1	2	1.5	27	28	21357	1.7	16.4	4.9	2.0	0.9	98.4	1.99	80	2.0
1379	651176	5441214	0.4	47.4	2.7	1	1.5	23	16	26150	0.7	15.1	2.5	1.3	0.6	44.3	0.54	104	3.0
1381	651199	5440382	0.7	48.0	0.3	3	1.5	16	27	9125	0.8	14.7	3.5	1.5	0.6	47.2	0.54	86	2.9
1382	650592	5437124	0.9	54.3	3.5	3	1.5	9	23	4836	0.9	16.5	3.8	1.6	0.6	13.4	0.34	54	2.9
1383	656202	5438847	0.9	63.8	0.25	1	1.5	11	22	7618	0.8	20.9	3.9	2.0	0.9	15.5	0.45	70	4.3
1384	657043	5439404	1.5	54.3	2.7	1	1.5	12	28	6814	1.1	24.5	3.5	3.0	0.7	16.7	0.60	60	3.3
1385	659050	5440524	1.8	17.7	2.3	1	1.5	30	24	24385	1.3	28.9	2.4	2.9	1.2	71.3	1.94	58	11.5
1387	659892	5439652	3.6	46.4	0.3	3	1.5	22	30	11758	0.7	19.3	3.1	1.9	0.7	62.9	1.51	59	1.3
1388	662687	5439190	0.9	40.6	0.3	2	1.5	14	15	6040	0.6	13.0	2.4	2.0	0.7	29.0	0.79	37	1.0
1389	659775	5438554	3.0	48.7	1.7	1	1.5	21	25	9257	1.0	16.0	3.0	2.0	0.9	55.5	1.35	53	1.3
1390	659108	5438074	4.5	54.7	2.4	1	1.5	22	23	10717	0.6	16.0	3.0	1.5	0.7	64.5	1.20	49	1.0
1391	660493	5436553	1.8	41.1	2.7	6	4	16	17	6628	0.7	14.2	2.3	1.3	0.4	28.8	1.13	42	1.2
1392	658392	5434282	11.2	56.7	2.1	1	1.5	49	24	15771	1.4	21.5	5.1	2.5	1.1	102.7	1.58	103	2.5
1394	661681	5434461	3.6	63.9	0.25	2	1.5	41	30	50878	1.3	16.2	3.2	2.8	1.1	133.1	1.97	98	5.3
1395	665379	5432832	3.0	31.4	4.2	5	1.5	29	32	26368	1.9	32.3	2.3	5.8	2.3	49.5	1.72	79	7.8
1396	672501	5433900	4.5	44.4	0.25	1	1.5	23	37	14327	0.6	18.5	2.9	2.9	1.1	56.1	0.86	73	1.7
1398	673417	5433842	0.7	41.3	2.5	1	1.5	8	23	3827	0.7	12.3	2.4	2.1	0.5	17.0	0.44	41	0.5
1399	673418	5432812	3.0	26.3	2	1	1.5	21	18	11633	0.5	15.2	2.8	1.8	0.9	34.4	0.66	50	1.8
1400	675589	5433016	10.6	53.4	4.2	1	1.5	20	18	10488	1.1	15.9	3.5	0.5	0.6	60.7	1.17	74	1.0
1401	677804	5433206	1.5	41.3	2.1	10	1.5	25	29	11716	0.9	19.8	2.9	2.1	1.0	64.2	0.66	61	1.6
1402	679437	5433400	9.4	36.7	0.25	1	1.5	38	32	20088	1.2	25.1	3.4	2.4	1.6	82.3	0.89	99	2.7
1404	675987	5434996	3.0	71.4	0.25	4	1.5	11	35	7097	1.6	16.2	1.9	2.3	1.5	29.5	0.73	53	1.4
1405	673649	5435590	7.3	33.9	2.6	1	1.5	36	26	41005	0.7	22.8	3.1	2.6	1.8	72.8	1.14	101	3.1
1406	676232	5436791	7.9	23.9	2.1	1	1.5	44	31	27115	1.0	28.2	4.3	2.7	2.0	91.3	1.33	115	3.9
1407	678045	5436297	9.1	23.9	0.25	1	1.5	39	25	28814	0.7	25.0	3.5	3.1	1.9	74.2	0.97	96	5.4
1408	679317	5437473	3.6	27.9	0.25	1	1.5	34	24	17164	0.8	25.3	2.5	2.5	1.3	70.9	1.61	81	4.0
1409	681124	5437696	7.9	24.0	1.2	1	1.5	31	16	32062	0.7	18.8	3.0	2.3	1.7	54.8	0.95	56	5.1
1410	675375	5438717	5.1	41.1	1.5	1	5	27	26	12534	0.5	19.0	4.0	4.2	2.1	56.9	0.94	60	2.5
1411	676000	5439736	6.0	21.4	1.8	1	1.5	41	23	32248	0.8	28.2	4.0	1.3	0.8	93.9	1.00	95	5.5
1412	675836	5440816	4.2	48.5	0.8	4	1.5	28	31	13690	2.1	23.0	3.6	1.6	0.8	61.9	0.87	65	1.9
1413	678408	5440921	9.1	52.7	2.3	3	1.5	38	40	33839	1.4	20.5	3.4	2.2	0.8	109.8	1.04	82	3.3
1415	679174	5440543	4.5	38.2	2	5	1.5	36	30	18398	0.8	25.5	3.4	1.9	1.0	97.2	1.01	86	3.2
1416	680726	5441198	3.6	29.3	4	1	1.5	49	21	39033	1.2	27.9	5.4	3.6	2.0	75.4	1.54	97	7.7
1417	679887	5441983	7.0	28.3	0.25	1	1.5	69	20	86185	1.4	29.2	3.5	2.6	1.6	90.1	1.41	135	9.2
1418	680729	5443510	10.0	54.6	2.6	1	1.5	35	44	32997	1.3	25.0	2.9	2.0	1.0	119.1	1.48	90	1.8
1419	679090	5443439	6.0	54.4	2.1	3	1.5	27	35	12158	1.1	18.3	3.2	1.9	1.0	88.1	1.20	70	1.7
1420	670701	5443105	1.5	68.6	4.1	1	1.5	21	10	113106	1.9	15.4	3.3	0.8	0.15	31.7	0.47	252	4.5
1421	669794	5443352	1.2	65.2	2.8	1	1.5	24	10	140748	1.2	11.0	2.9	1.3	0.6	28.5	0.52	120	4.5
1422	671999	5446418	3.0	70.5	3.2	1	1.5	87	8	10387	0.5	12.3	2.2	1.5	0.9	19.8	0.44	68	3.0
1423	678087	5447466	11.5	44.9	3.8	1	1.5	42	41	44493	1.8	25.6	3.7	1.7	1.0	134.2	1.70	119	2.3
1424	679807	5448811	4.2	33.9	0.25	1	1.5	36	32	25897	1.1	25.9	2.9	2.5	1.3	100.1	1.75	113	3.2
1426	680568	5449892	14.6	45.5	4	8	1.5	44	44	30967	1.8	24.5	7.4	2.3	1.1	143.7	1.92	142	2.3
1427	672186	5451237	10.6	46.6	3.4	1	1.5	30	42	52781	2.1	27.7	4.7	3.1	1.2	380.8	4.51	112	2.3
1428	671018	5450428	0.6	28.9	4.4	4	1.5	33	47	28863	4.2	33.7	5.1	10.3	2.6	97.0	8.17	48	10.6
1429	671653	5451556	14.9	36.7	3.4	1	1.5	56	27	223305	1.8	16.8	3.0	3.4	1.0	442.0	8.27	84	10.3
1430	672239	5452270	2.1	36.1	2.9	3	1.5	30	22	11694	1.2	19.7	5.5	1.5	0.8	56.2	1.00	77	3.8
1432	672279	5454919	2.7	26.3	2.5	1	1.5	41	23	24975	0.9	16.1	4.7	2.5	0.7	92.3	6.49	57	6.0
1433	673200	5457578	3.9	33.2	4	1	1.5	46	32	133099	4.4	21.9	4.5	5.5	1.6	177.0	12.54	67	8.0
1434	672705	5458022	14.6	42.3	4.3	2	1.5	46	29	200679	7.1	19.2	4.3	3.9	1.1	244.5	10.08	95	7.9
1435	669715	5458547	4.2	35.8	4.2	6	1.5	54	38	74035	2.1	24.7	4.8	2.4	0.8	108.4	7.58	129	9.5
1436	670781	5459390	2.7	29.6	0.7	4	1.5	54	30	92701	1.6	28.4	3.6	1.2	1.0	88.9	6.66	145	13.8
1437	672654	5460675	3.6	50.8	0.6	1	1.5	21	23	27425	1.0	12.3	3.8	0.15	0.5	208.7	2.87	58	2.6
1438	664040	5500570	1.8	35.8	0.25	1	1.5	14	22	6026	1.2	13.3	2.5	0.15	0.5	122.1	6.55	46	0.6
1439	662541	5500584	1.0	57.4	2.3	1	1.5	23	12	25581	1.6	11.2	2.2	0.15	0.3	145.2	3.14	80	5.3
1440	662057	5499656	0.7	38.3	4.6	1	1.5	33	19	50086	1.0	13.1	5.1	0.15	0.6	192.2	6.15	72	8.8
1441	661997	5499312	2.7	39.2	2.9	1	1.5	63	25	129976	1.8	26.7	5.7	0.5	0.15	236.7	13.19	163	17.0
1442	660988	5500016	1.8	55.3	2.6	1	1.5	15	25	6408	3.8	7.4	2.6	2.4	0.6	125.9	16.77	52	4.3
1443	660650	5499690	5.1	44.5	4.6	1	1.5	65	40	114457	2.5	26.6	6.4	1.4	0.6	110.4	19.34	152	19.2
1444	659830	5498681	1.8	40.7	0.4	5	1.5	27	20	45041	1.5	10.9	2.9	0.15	0.4	101.3	12.53	66	5.9
1445	659098	5499202	1.8	39.5	0.35	2	1.5	27	24	28005	1.4	12.2	3.0	0.4	0.5	248.7	6.17	62	3.5
1446	653882	5499639	4.5	23.3	0.25	2	1.5	37	19	46547	1.3	18.8	3.9	0.15	0.4	153.4	5.56	90	3.4
1448	655689	5502237	6.0	39.9	19	1	1.5	50	36	82072	2.6	19.6	5.1	4.3	1.3	106.5	14.41	222	12.2
1449	654467	5503054	1.5	33.0	4.2	2	1.5	20	18	10118	1.0	12.5	2.2	0.3	0.3	68.2	7.20	52	1.6
1450	654204	5503977	2.7	53.7	6.1	2	1.5	47	66	37978	2.4	26.0	5.3	2.4	1.0	110.8	15.31	116	16.5
1451	652610	5502964	5.1	33.7	8.7	3	1.5	82	46	119100	1.4	31.9	5.9	0.15	0.4	96.7	11.76	209	21.9

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav.	INAA	INAA	FAICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FAICPMS	FAICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1452	650148	5503801	1.5	38.7	2.7	1	1.5	22	10	20564	0.5	12.0	3.7	0.15	0.15	88.0	9.28	48	6.2
1454	649485	5502676	11.2	39.2	15	2	1.5	34	45	31475	2.3	17.5	4.3	1.2	0.9	170.7	22.02	83	3.2
1455	647689	5502068	1.8	67.7	3.5	1	1.5	27	22	7572	2.2	19.2	4.1	0.4	0.15	41.1	1.91	163	5.3
1456	648953	5501200	24.6	40.7	15	7	1.5	44	59	86986	8.0	32.3	4.9	2.1	1.1	270.0	10.25	176	2.6
1457	649215	5499910	14.6	40.3	7.8	5	1.5	43	58	72065	4.9	35.2	5.1	1.9	1.2	565.8	7.41	182	2.9
1458	649627	5498540	21.9	44.8	12	2	1.5	40	44	103302	6.2	26.2	5.3	1.1	0.9	300.5	5.60	153	3.0
1459	648710	5497790	2.4	50.4	7	2	1.5	30	37	90047	4.5	17.9	4.7	1.1	1.0	141.5	6.42	120	7.4
1460	648063	5497682	2.1	51.2	5.4	2	1.5	46	46	130964	1.8	18.0	5.9	1.2	0.7	583.6	4.59	96	15.0
1461	647257	5497554	1.8	43.3	4.7	1	1.5	25	33	20085	2.8	22.3	2.5	0.3	0.15	109.3	3.51	80	2.4
1462	648657	5493439	6.0	60.0	0.3	2	1.5	28	32	23893	1.3	19.3	4.6	0.15	0.6	207.5	2.15	119	2.0
1463	649612	5493709	6.7	49.8	0.25	1	1.5	23	32	13993	0.9	16.6	3.9	0.15	0.4	162.4	1.64	89	1.9
1465	650583	5491117	3.0	31.6	2.9	6	1.5	25	20	17250	0.7	19.1	3.0	0.15	0.6	118.3	1.82	73	3.7
1466	647770	5489210	9.7	53.2	2.9	2	1.5	17	44	5464	2.1	13.2	3.7	1.5	0.7	83.7	3.02	91	4.5
1467	653528	5487141	5.4	41.6	0.25	4	1.5	25	21	26299	1.0	14.5	3.5	0.15	0.6	198.6	2.65	92	3.5
1468	654195	5488599	18.8	29.1	3	5	1.5	35	25	88159	2.2	18.1	5.3	0.15	0.6	181.4	2.87	106	4.5
1469	656226	5489713	1.8	49.0	0.25	1	11	14	11	18606	0.6	11.4	2.6	0.15	0.15	73.0	0.98	62	1.7
1471	654779	5491157	1.5	43.2	0.8	1	1.5	12	11	7858	0.7	13.2	2.8	0.15	0.15	51.9	1.22	60	0.8
1472	654206	5490918	1.8	34.3	0.25	1	1.5	22	14	11905	0.5	16.2	2.5	0.15	0.5	80.1	1.60	66	2.2
1473	654999	5489620	9.7	60.5	0.25	1	1.5	29	22	111397	1.3	12.9	4.8	0.15	0.15	254.4	3.14	79	5.9
1474	660691	5486280	4.8	20.5	0.25	1	1.5	36	17	79895	1.7	19.2	4.1	0.6	1.1	219.7	18.30	113	10.8
1475	658473	5486069	3.9	26.7	3.1	1	1.5	40	17	80740	1.4	19.9	4.0	0.6	0.7	220.1	15.67	127	12.7
1476	656097	5486503	3.0	32.7	0.25	1	1.5	22	15	8968	0.7	15.6	2.6	0.15	0.15	59.6	2.71	59	1.4
1477	653391	5485294	2.1	42.8	0.25	1	1.5	17	30	16191	1.4	13.2	2.6	0.15	0.4	170.9	4.60	84	2.3
1478	652715	5485840	4.2	38.2	2.3	1	1.5	38	22	46367	1.2	19.7	3.8	0.3	0.6	199.8	3.37	111	3.4
1479	651822	5492473	5.1	43.2	0.25	3	1.5	19	28	7596	1.0	10.6	3.1	0.15	0.9	65.8	2.05	56	2.5
1481	650528	5495045	4.2	44.9	2.3	1	1.5	21	25	10505	0.7	13.2	3.3	0.15	0.8	90.8	1.62	71	1.9
1482	651516	5495424	1.5	49.8	2.9	1	1.5	10	13	4442	0.6	13.6	2.1	0.15	0.6	30.3	1.25	59	0.9
1483	652573	5496518	4.5	43.9	2.9	1	1.5	36	24	43592	1.1	25.0	4.6	0.3	0.6	138.1	4.42	127	2.3
1484	652504	5495203	3.0	41.8	2	1	1.5	20	22	17123	0.8	18.9	3.3	0.15	0.7	96.4	1.79	88	1.0
1485	653370	5494898	0.9	34.3	3.2	1	1.5	27	16	13989	0.9	20.2	3.9	0.15	1.1	164.2	3.99	90	2.3
1486	653750	5494357	2.7	40.5	3.3	1	1.5	38	23	32169	1.4	26.7	3.5	0.15	0.8	203.3	10.64	128	7.6
1488	653502	5493790	3.6	33.3	2.3	1	1.5	28	20	19901	0.9	20.8	4.0	0.15	0.8	128.6	2.96	96	1.8
1489	654612	5492783	3.9	36.9	1.5	1	1.5	22	23	19918	1.1	16.2	4.6	0.15	0.7	190.2	3.60	84	3.6
1490	654294	5491895	4.5	35.1	0.25	1	1.5	25	23	18815	0.8	20.6	4.5	0.15	0.8	195.1	3.01	85	1.7
1491	655449	5495551	3.9	31.1	3	1	1.5	26	15	23643	0.9	17.9	4.3	0.15	0.7	87.0	2.69	92	1.7
1492	655337	5496815	3.0	30.0	2.3	1	1.5	25	17	25927	0.7	18.0	3.9	0.15	0.8	101.0	3.26	95	2.3
1493	656741	5495569	1.2	51.1	4.8	3	1.5	18	23	6477	2.6	14.6	2.8	1.0	0.8	66.8	3.42	81	5.2
1494	656526	5494692	11.2	40.7	4.1	1	1.5	27	45	15136	2.2	15.9	4.4	1.3	1.0	193.3	8.92	110	2.3
1495	656521	5493598	9.7	21.6	3.8	4	1.5	41	37	74474	2.7	22.5	5.6	1.5	1.0	264.9	6.93	136	4.3
1496	656640	5491774	21.9	43.0	5.1	4	1.5	25	24	236200	2.0	9.3	4.1	0.9	0.4	306.9	3.40	86	8.2
1498	658223	5491932	3.0	39.0	3.4	1	1.5	35	21	44321	1.0	19.6	2.8	0.5	0.6	135.7	6.81	117	6.5
1499	659095	5490740	5.4	37.8	3.5	2	1.5	28	21	36382	1.3	17.8	5.5	0.9	0.8	113.1	9.20	103	4.8
1500	658153	5490180	2.7	29.8	2.3	1	1.5	30	23	46891	1.8	17.9	4.7	0.4	0.6	188.7	8.11	104	4.2
1501	659169	5486611	3.6	17.2	2.7	1	1.5	34	16	72032	1.3	17.6	4.0	0.7	1.0	203.3	16.77	117	11.2
1502	661347	5488391	4.2	10.9	1.2	1	1.5	30	10	196746	7.1	11.5	1.7	0.15	0.6	106.5	12.78	139	5.1
1503	662295	5488985	3.9	15.5	1.3	1	1.5	29	13	70069	0.7	15.3	3.3	0.5	1.0	137.1	8.40	105	8.9
1505	662256	5493325	1.8	29.0	1.8	4	1.5	18	11	11453	0.9	9.8	2.5	0.3	0.8	62.4	4.52	53	2.0
1506	680476	5458965	4.2	36.0	1.4	1	1.5	16	19	16603	1.5	14.8	2.6	0.6	1.0	41.7	0.76	76	1.7
1507	679053	5458951	3.0	25.8	3.1	3	1.5	35	19	60086	0.6	22.8	2.8	1.6	1.2	66.3	2.46	138	6.5
1508	677136	5458786	3.0	25.9	0.25	1	1.5	45	37	147697	1.8	27.7	3.4	2.2	1.2	210.8	4.10	187	11.5
1509	675384	5458577	1.5	NS															
1510	674344	5459003	4.5	51.8	3.9	7	1.5	35	61	49344	8.8	24.7	3.5	4.8	1.3	111.8	16.90	95	6.1
1511	673289	5458641	3.3	58.1	2.3	1	1.5	18	20	7214	2.1	7.6	2.2	2.2	0.15	24.3	3.02	69	2.5
1512	671702	5459265	1.8	49.7	2.6	6	1.5	9	19	32314	1.1	10.3	1.6	0.4	1.0	42.0	0.88	89	1.4
1513	673536	5459435	2.4	48.5	3.2	1	1.5	21	26	10623	3.7	15.5	2.8	1.2	0.9	40.7	1.76	118	1.9
1515	674281	5460231	3.6	74.0	5.1	2	INF	51	NM	NM	10.2	29.9	2.2	INF	INF	218.9	24.52	NM	9.6
1516	661741	5471219	1.8	34.1	0.25	11	1.5	17	18	34055	0.6	12.2	2.7	0.6	0.8	540.3	7.00	84	11.1
1517	660800	5472819	5.1	30.0	2.7	3	1.5	42	20	309657	26.5	19.2	3.4	0.8	0.5	588.1	40.86	184	16.7
1518	659727	5472996	0.9	47.5	3.2	3	1.5	44	26	147273	5.6	24.3	6.0	1.4	0.9	778.4	39.29	120	22.0
1519	659245	5472903	2.7	56.7	0.3	1	1.5	19	11	97446	1.4	14.3	1.7	0.3	0.8	135.0	1.98	149	9.8
1521	657334	5472782	3.6	24.2	0.25	1	INF	52	20	202000	11.2	21.3	6.6	INF	INF	709.5	26.87	163	20.8
1522	658524	5473357	0.9	42.0	0.45	2	1.5	12	29	114929	2.1	16.5	2.2	1.2	1.2	695.7	5.90	121	3.2
1523	658766	5474100	1.5	50.6	0.3	1	1.5	10	18	25761	1.2	9.9	2.2	0.15	0.7	91.4	4.18	86	1.4
1524	659415	5474301	3.0	30.9	0.3	4	1.5	11	22	45822	0.9	10.0	1.7	0.15	0.9	186.3	4.53	102	3.2
1525	660551	5473403	3.0	40.2	3.3	4	1.5	37	21	182860	3.7	20.5	3.7	0.6	1.0	693.6	11.38	140	16.7

Sample	Easting	Northing	Lake	LOI	As	Au	Au	Cr	Cu	Fe	Mo	Ni	Pb	Pd	Pt	Total REEs	U	Zn	Zr
Number	Method----->		Depth	Grav	INAA	INAA	FA/ICPMS	ICPMS	ICPOES	ICPOES	ICPMS	ICPMS	ICPMS	FA/ICPMS	FA/ICPMS	ICPMS	ICPMS	ICPOES	ICPMS
	Detection Limit----->			0.1	0.5	2	3	1	5	5	0.1	0.5	0.05	0.3	0.3	0.05	0.05	2	0.1
	Units----->		m	%	ppm	ppb	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppm	ppm	ppm	ppm
	(NAD 27 UTM Zone 15)																		
1556	654921	5472286	2.0	48.3	0.5	1	1.5	10	11	10647	1.8	7.8	3.1	0.39	0.36	37.6	1.9	46	0.4
1557	654480	5474356	2.0	36.2	0.25	1	1.5	16	12	13074	1.4	8.0	2.8	0.75	0.55	171.6	11.67	43	0.5
1558	653841	5476660	2.0	9.7	0.25	1	1.5	21	8	35337	0.8	9.7	4.0	0.71	0.48	153.7	6.09	57	5.4
1559	655308	5476470	2.0	45.1	0.25	2	4.8	11	23	2742	1.7	10.0	2.9	0.60	0.46	238.9	16.78	54	0.5
1561	655301	5475911	1.0	35.8	2	1	1.5	18	18	42798	4.1	10.0	4.3	0.15	0.60	>10204.0	25.84	55	3.1
1562	655454	5474743	2.0	24.5	0.25	2	1.5	12	7	9956	1.0	5.1	3.3	0.38	0.63	113.0	7.59	33	0.9
1563	656369	5473550	2.0	19.4	0.25	3	1.5	11	10	12134	0.8	6.0	4.4	0.15	0.15	149.5	6.40	38	2.7
1564	657893	5473320	1.0	33.5	2	1	1.5	10	12	8294	0.8	9.3	3.8	0.49	0.49	140.7	5.21	34	0.5
1565	658992	5473524	1.0	37.4	3	2	1.5	18	17	11660	1.1	13.7	5.0	0.15	0.46	245.5	5.45	49	0.3
1566	660219	5473885	1.0	19.1	3	6	1.5	23	11	10231	0.8	15.3	6.3	0.15	0.34	141.0	3.64	80	1.1
1567	660601	5473451	2.0	39.7	0.5	2	1.5	28	20	182565	2.6	14.0	3.4	0.60	0.77	>10107.0	9.39	115	10.0
1568	667580	5476736	2.0	46.1	3	6	1.5	40	59	115573	4.1	31.5	5.4	1.90	0.64	>10269.0	38.44	152	9.5
1569	667541	5477374	1.0	54.5	2	1	1.5	21	11	14654	1.4	10.8	4.0	0.49	0.44	83.7	1.51	77	2.2
1571	668477	5479259	1.0	45.1	3	4	1.5	42	14	277843	3.4	9.1	2.5	0.74	0.15	>10184.0	5.64	100	9.6
1572	669535	5480088	3.0	61.4	0.5	1	1.5	17	19	7175	1.9	12.2	3.6	0.15	0.51	36.5	1.90	83	0.2
1573	670078	5480299	2.0	NS															
1574	670375	5480879	2.0	39.0	2	6	3.2	39	33	166566	2.2	17.9	4.2	1.12	0.56	>10123.0	10.09	108	11.1
1575	669981	5479642	2.0	60.3	2	1	1.5	15	16	20549	1.2	11.7	3.5	0.74	0.55	34.9	1.42	87	0.5
1576	669512	5479134	10.0	49.5	5	1	3.0	53	43	77381	4.4	26.4	8.1	2.10	0.84	>10150.0	14.18	126	12.8
1577	669577	5478480	2.0	NS															
1578	670706	5477606	2.0	45.3	2	2	1.5	18	27	38708	3.5	10.6	4.2	0.40	0.49	273.3	15.93	78	1.0
3019.2	661925	5471550	8.0	31.2	0.5	7	INF	24	19	26189	1.4	14.9	4.4	INF	INF	388.5	14.88	59	6.34
3020.2	661925	5471550	8.0	31.3	0.5	40	INF	23	17	20246	1	13.6	9.1	INF	INF	375.3	14.33	55	4.49
3021.4	661925	5471550	8.0	30.1	2	4	INF	22	16	23473	1.2	13.5	3.5	INF	INF	364.4	12.19	56	6.19
5111	661198	5439556	3.7	43.2	1.2	1	INF	39	30	15400	1.1	21	QC	INF	INF	74.2	1.48	69	QC
5112	660443	5434316	5.5	47.0	2.2	1	INF	52	27	31900	2.0	24	QC	INF	INF	78.4	2.27	73	QC
5113	668611	5433358	4.0	36.8	2.3	1	INF	54	38	48500	1.0	27	QC	INF	INF	124.1	1.72	107	QC
5114	663201	5433206	1.5	47.7	1.1	1	INF	22	14	5600	1.2	13	QC	INF	INF	26.7	0.73	35	QC
5121	661952	5450228	4.3	45.3	1.3	1	INF	42	33	19700	1.2	21	QC	INF	INF	102.7	1.77	96	QC
5122	664592	5449803	1.8	46.7	1.9	1	INF	43	22	31000	1.7	28	QC	INF	INF	62.9	1.20	90	QC
5123	665007	5445174	3.0	32.6	1.5	1	INF	68	9	480080	1.8	22	QC	INF	INF	213.8	1.65	91	QC
5124	660500	5441778	9.8	29.8	1.3	1	INF	71	11	273810	1.6	22	QC	INF	INF	217.0	1.91	89	QC
5131	661903	5458882	4.0	43.7	2.8	1	INF	62	21	160780	2.3	24	QC	INF	INF	217.1	5.51	121	QC
5132	666510	5458615	1.2	42.6	1.6	1	INF	40	16	18000	1.2	20	QC	INF	INF	66.8	1.65	78	QC
5133	667016	5453638	15.2	37.4	1.1	7	INF	60	19	76400	1.5	20	QC	INF	INF	272.2	3.78	79	QC
5134	664781	5453933	10.7	51.6	1.2	1	INF	38	24	45300	1.5	17	QC	INF	INF	76.0	1.34	76	QC
5141	660740	5467560	3.0	28.2	1.5	1	INF	51	21	44600	2.2	17	QC	INF	INF	258.7	5.56	75	QC
5142	667285	5470861	3.7	67.2	2.1	1	INF	33	21	8200	2.0	12	QC	INF	INF	41.5	2.23	135	QC
5143	668322	5462654	4.3	40.0	1.7	1	INF	73	31	181380	2.6	23	QC	INF	INF	450.8	9.14	125	QC
5144	659573	5463935	4.3	42.4	1	1	INF	27	15	16100	1.5	15	QC	INF	INF	50.5	1.61	66	QC
5151	661803	5477841	1.5	47.5	2.4	1	INF	44	20	92500	14.7	19	QC	INF	INF	335.6	21.92	113	QC
5152	665851	5478687	4.6	53.6	2.1	1	INF	41	24	12000	2.1	16	QC	INF	INF	77.7	8.38	106	QC
5153	666538	5472392	1.5	71.8	1.8	1	INF	22	7	16000	1.3	8	QC	INF	INF	28.8	1.32	53	QC
5154	660765	5472826	8.2	32.7	3.3	1	INF	48	16	423560	14.3	21	QC	INF	INF	331.3	24.14	158	QC
5161	662748	5490320	3.7	21.9	1.3	1	INF	53	14	63700	1.5	19	QC	INF	INF	160.9	9.07	108	QC
5162	664884	5487557	16.8	62.2	3.6	1	INF	30	20	11800	4.1	12	QC	INF	INF	47.3	14.79	64	QC
5163	665400	5484908	1.2	49.0	3.7	1	INF	39	16	32200	8.0	15	QC	INF	INF	122.9	25.88	153	QC
5164	661321	5483964	0.9	43.3	1.1	1	INF	22	10	12800	3.2	8	QC	INF	INF	163.5	18.71	37	QC
5171	662084	5498524	3.0	43.5	2.9	1	INF	58	19	146170	1.6	18	QC	INF	INF	230.6	9.38	138	QC
5172	663779	5499162	1.2	64.3	2.1	1	INF	31	10	19800	2.2	9	QC	INF	INF	58.7	3.00	64	QC
5173	665514	5492303	1.2	37.0	3	1	INF	33	17	17100	0.9	17	QC	INF	INF	137.1	6.67	80	QC
5174	659980	5495872	3.0	66.2	1.9	1	INF	24	12	33100	1.3	9	QC	INF	INF	39.4	2.01	82	QC
5181	660820	5506329	1.1	41.4	5.6	1	INF	38	52	27800	3.9	22	QC	INF	INF	106.9	20.17	95	QC
5182	667994	5509923	1.5	59.0	1.9	1	INF	33	17	10700	2.4	13	QC	INF	INF	66.3	11.70	82	QC
5183	663465	5501241	1.1	38.2	2.1	1	INF	26	15	21100	1.6	14	QC	INF	INF	71.4	3.39	75	QC
5184	661661	5501677	3.0	17.2	2.2	1	INF	49	30	56400	1.2	20	QC	INF	INF	201.5	14.02	83	QC
		mean	4.3	41.2	2.2	2.3	1.6	30.1	24.7	51013	2.2	18	4.3	1.5	0.9	214.9	8.3	88.9	5.9
		median	3.0	40.7	2.1	1.0	1.5	27.3	23.0	26608	1.5	17	4.0	1.3	0.9	128.4	5.6	84.0	4.3
		std dev	3.8	12.9	1.9	2.6	0.6	14.6	12.4	63631	2.4	6	1.7	1.2	0.4	251.7	9.3	36.2	4.9
		n	511	501	501	501	451	496	498	498	496	496	464	451	451	489	496	498	464
		min	0.3	8.3	0.3	1.0	1.5	0.5	6.0	2742	0	0	1	0.2	0.2	9.2	0.3	13.0	0.1
		max	24.6	75.8	19.0	40.0	11.4	94.4	101.0	480080	26.5	41	12.0	10.3	2.9	3047.5	86.9	311.0	22.6

Notes: NS = No Sample; INF = Insufficient sample for analysis; NM = Not Measured, sample lost or contaminated at lab; QC = quality control problem

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.

MAPS NOT FILMED

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